INCOMES POLICY IN THE U.K. 1960-79:

MODELLING AND ANALYSIS

by

John D. Whitley

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Summary

The research examines three aspects of incomes policy: its measurement; its appropriate incorporation in an aggregate model of wage inflation; and the empirical explanation of changes in incomes policy. A continuous quantity measure of policy is derived which incorporates the various pieces of information and attitudes regarding policy. Inclusion of the policy variable in a real wage resistance model of wage inflation finds a statistically significant policy influence but considerable average slippage between ex-ante and ex-post policy influence. Significant incomes policy catch-up effects are also found but these are weaker the longer the length of preceding policy. The most important policy effects on wages identified are in the wage freezes of 1966 and 1972 and during the policy of 1975-77. The stance of incomes policy is reasonably successfully explained by changes in the inflation rate and by deviations of employment from a moving trend of unemployment so that a persistently high level of unemployment is discounted for policy purposes. However, there is considerable inertia in the setting of incomes policy. The overall implication of the wage and policy model developed is that changes in policy can either magnify or dampen exogenous shocks to the wage-price sub-sector and thus policy feedback is not inherently stabilising.

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ABBREVIATIONS USED

Institutions

CBI	Confederation of British Industry
CEPG	Cambridge Economic Policy Group
DAE	Department of Economic Affairs
DE	Department of Employment
EEC	European Economic Community
GMWU	General and Municipal Workers' Union
IMF	International Monetary Fund
NBPI	National Board for Prices and Incomes
NIC	National Incomes Commission
NIESR	National Institute for Economic and Social Research
TUC	Trade Union Congress

Other

DCE	Domestic credit expansion
GDP	Gross domestic product
HP	Hire-purchase
M3	Measure of money supply, M3
PSBR	Public sector borrowing requirement

STATISTICAL TERMS AND NOTES

OLS	Ordinary least squares
IV	Instrumental variable
3SLS	Three stage least squares
TSP	Time Series Processor
GIVE	General Instrumental Variable Estimator
DW	Durbin Watson statistic
Durbin 'h'	Durbin 'h' statistic
$\bar{R}^2$	Degree of fit, adjusted for degrees of freedom
$\chi^2_{(i)}$	Chi-squared test statistic for i degrees of freedom
*	denotes a statistically significant value at the 10 per cent significance level
**	denotes a statistically significant value at the 5 per cent significance level.
log	natural logarithm
X_{t-i}	variable X lagged by i periods
$\chi^2_{(4)}$	is the forecast test for 4 quarters (χ^2_4 (.005) = 11.1)
$\chi^2_{(8)}$	is the joint test of first to eighth order serial correlation ($\chi^2_{(8)}$ (.005) = 17.5)
RSS	residual sum of squares
RHO	first order serial correlation
†	imposed coefficients
( )	below coefficients indicates t value
..	not available
SE	standard error

CHAPTER 1 INTRODUCTION

1.1 Objectives of the thesis

> "Incomes policy ...... constitutes an attempt to solve a politically created economic policy problem by political means. The evidence of past experience along these lines is overwhelmingly negative; but it is a characteristic of political animals that they have the infinite self-confidence that is born of solipsism and the disregard of past and others' experience as irrelevant, which is expressed in the view that past failures are attributable to the lack of determination or the lack of astuteness of others than oneself".
>
> H.G. Johnson (1972, pp.269-70)

The above quotation leaves little room for further analysis of incomes policy. The main aim of this thesis is to argue that incomes policies have been inadequately modelled so that any previous judgement on the past (or future) efficacy of incomes policies is at best premature.

The typical approach towards estimating and modelling the effects of incomes policy has been one of treating incomes policy in the manner of a shift in economic behaviour and as a nuisance which complicates the estimation of the underlying structural parameters of the system. However, the frequency and variety of incomes policy has been regarded as appearing out of the blue, like some *deus ex machina*, rather than as a conscious decision of the economic authorities related to other economic developments.

This thesis attempts to remedy these defects by providing a more general framework whereby incomes policies can be included in a formal representation of the macroeconomic system. Since, however, incomes policy is not an homogeneous economic policy instrument, as say income tax rates, there are some limits to the extent of generalisation possible. By concentrating on three specific areas this thesis aims to extend the existing area of modelling of incomes policy at the macroeconomic level.

The first specific area developed concerns the measurement of incomes policy itself. Traditional analysis has treated incomes policy as discontinuous and has made little attempt to quantify the variations in incomes policy over the past. By using some of the available information on incomes policy over the period the thesis is able to generate a continuous and quantifiable measure of incomes policy which can be used to assess the ex-ante pressure of policy, something which is not possible using the approaches hitherto applied to UK economic policy.

The second area of work relates to the specification of incomes policy within aggregate wage equations. Empirical estimation of wage equations has tended to treat incomes policy as a temporary irritant to the wage determination process whereas the frequency and scale of policy intervention requires modelling incomes policy as an integral part of the wage determination process. In addition, issues such as the timing of policy and expectational elements have also been virtually ignored by the previous economic literature.

The third area of concern relates to the explanation of the imposition and strength of incomes policy over the period. Not only does the assumption of exogeneity of incomes policy have implications for simulations with macroeconomic models (since such simulations can never predict the introduction of incomes policy) but it may also bias the parameters of the wage equation itself.

1.2 Outline of the research

In order to achieve some of the aims of this thesis, notably that regarding the measurement of incomes policy, it is essential to decide upon an appropriate definition.

Although there has been some general agreement in the literature on specific instances of incomes policy, for example the pay freeze of 1966, a consensus does not emerge so clearly for some of the other policy episodes of the 1960s and 1970s. In particular, there is some divergence in the empirical literature (see Table 1.1) over the exact ending of particular policies. Further, there has tended to be some dispute over the classification of certain policy episodes which have been more implicit than explicit (for example the 'n-1' policy of 1971-2). The following section of the thesis is therefore devoted to discussion of the issues regarding the definition of incomes policy and their appropriateness for economic modelling.

In the second chapter of the thesis the previous treatment of modelling of incomes policy is examined and its limitations explored. This is followed by some discussion of the empirical estimates of incomes policy on aggregate wages derived from previous studies.

In the third chapter of the thesis the proposed general approach to modelling incomes policy is discussed together with its relationship to previous work in the area. Quantitative <u>ex-ante</u> measures of incomes policy are derived using the "pressure" approach modified by a more subjective indicator representing the political stringency of the policy from both the government side and from general trade union reaction. The "pressure" approach emphasises the impact of incomes policy on real wages and uses information from announced wage norms or guidelines and exceptions to these norms. This approach then produces a quantity variable which indicates variations in policy pressure. However, an <u>ex-ante</u> strength indicator needs to be applied to this measure before we can use it as a comparative measure of policy strength since the same policy might be applied to different degrees by government or opposed to a different extent by trade unions. Here the case study element as

Table 1.1 Alternative Incomes Policy Periods

		NPBI	Lipsey and Parkin	Smith	Parkin	Parkin et al.	Henry et al.	Sheriff	Henry and Ormerod	Sargan
1961	(1)	ON(1)	ON(1)							
	(2)	ON(1)	ON(1)							
	(3)	ON(1)	ON(1)	ON(1)	ON(1)	ON(1)		AN(1)		
	(4)	ON(1)	ON(1)	ON(1)	ON(1)	ON(1)		ON(1)		
1962	(1)	ON(1)	ON(1)	ON(1)	ON(1)	ON(1)		ON(1)		
	(2)	ON(1)	ON(1)	ON(1)	ON(1)	ON(1)		AN(2)		
	(3)	ON(1)	ON(1)	ON(2)	ON(1)			ON(2)		
	(4)	ON(1)	ON(1)	ON(2)	ON(1)			ON(2)		
1963	(1)		ON(1)	ON(2)	ON(1)			ON(2)		
	(2)		ON(1)	ON(2)	ON(1)			ON(2)		
	(3)		ON(1)	ON(2)	ON(1)			ON(2)		
	(4)		ON(1)	ON(2)	ON(1)			ON(2)		
1964	(1)		ON(1)	ON(2)	ON(1)			ON(2)		
	(2)		ON(1)	ON(2)	ON(1)			ON(2)		
	(3)		ON(1)		ON(1)			ON(2)		
	(4)		ON(2)		ON(2)			ON(2)		
1965	(1)	ON(2)	ON(2)	ON(3)	ON(2)					ON(1)
	(2)	ON(2)	ON(2)	ON(3)	ON(2)					ON(1)
	(3)	ON(2)	ON(2)	ON(3)	ON(2)					ON(1)
	(4)	ON(2)	ON(2)	ON(3)	ON(2)			AN(3)		ON(1)
1966	(1)	ON(1)	ON(2)	ON(3)	ON(2)			ON(3)		ON(1)
	(2)	ON(1)	ON(2)	ON(3)	ON(2)			ON(3)		ON(1)
	(3)	ON(1)	ON(2)	ON(4)	ON(2)	ON(2)	ON(1)	AN(4)	ON(1)	ON(1)
	(4)	ON(1)	ON(2)	ON(4)	ON(2)	ON(2)	ON(1)	ON(4)	ON(1)	ON(1)
1967	(1)		ON(2)	ON(4)	ON(2)	ON(2)	ON(1)	ON(4)	ON(1)	ON(1)
	(2)		ON(2)	ON(4)	ON(2)	ON(2)	ON(1)		ON(1)	ON(1)
	(3)		ON(2)		ON(2)				ON(2)/CA(1)	ON(1)
	(4)		ON(2)		ON(2)				ON(2)/CA(1)	ON(1)
1968	(1)		ON(2)		ON(2)				ON(2)/CA(1)	ON(1)
	(2)		ON(2)		ON(2)			AN(5)	ON(2)/CA(1)	ON(1)
	(3)				ON(2)			ON(5)	ON(2)	ON(1)
	(4)				ON(2)			ON(5)	ON(2)	ON(1)
1969	(1)				ON(2)			ON(5)	ON(2)	ON(1)
	(2)							ON(5)	ON(2)	ON(1)
	(3)							ON(5)	CA(2)	ON(1)
	(4)							ON(5)	CA(2)	ON(1)
1970	(1)								CA(2)	
	(2)								CA(2)	
	(3)								CA(2)	
	(4)								CA(2)	
1971	(1)								CA(2)	
	(2)								CA(2)	
	(3)									
	(4)									ON(2)
1972	(1)									ON(2)
	(2)									ON(2)
	(3)									ON(2)
	(4)						ON(2)	AN(6)	ON(3)	ON(2)
1973	(1)						ON(2)	ON(6)	ON(3)	ON(2)
	(2)						ON(2)	AN(7)	ON(4)/CA(3)	ON(2)
	(3)						ON(2)	ON(7)	ON(4)/CA(3)	ON(2)
	(4)						ON(2)	ON(7)	ON(4)	ON(2)
1974	(1)								ON(4)	
	(2)								CA(4)	
	(3)								CA(4)	
	(4)								CA(4)	
1975	(1)								CA(4)	
	(2)									
	(3)									
	(4)									
1976	(1)									
	(2)									
	(3)									
	(4)									
1977	(1)									
	(2)									
	(3)									
	(4)									
1978	(1)									
	(2)									
	(3)									
	(4)									
1979	(1)									
	(2)									
	(3)									
	(4)									

Notes:

________________________	denotes end of estimation period
AN	denotes announcement dummy
CA	denotes catch-up dummy

The numbers in brackets signify the different policy periods distinguished.

Sources:

N.B.P.I. (1968)

Lipsey and Parkin (1970)

Smith (1968)

Parkin (1972)

Parkin et al. (1976)

Henry et al. (1976)

Sheriff (1977)

Henry and Ormerod (1978)

Sargan (1980)

as opposed to the general economic modelling part of the thesis is relevant. The approach to explaining different policy strengths is that of an extension and modification to the reaction function approach to economic policy.

Problems in producing a continuous, rather than discrete, measure of policy are also discussed in Chapter 3 and this discussion is particularly relevant to the generalisation of incomes policy in the aggregate wage equation which follows upon an approach first applied to Canadian data by Reid (1979) but which adopted a discrete approach to the modelling of incomes policy.

A description of the development of incomes policy over the period under consideration is given in Chapter 4 in order to highlight the differences in the form of policy. The setting of incomes policy against the underlying macroeconomic environment is also discussed and this is particularly relevant for the area of research concerned with the endogeneity of policy.

The following chapter is concerned with the derivation of quantitative indicators of policy using the basic "pressure" approach. Derivation of these indicators also takes account of the severity with which the policy was intended to be applied and the extent of TUC opposition to it. Problems of implicit wage norms are discussed and timing problems are also incorporated into the indicators. Having derived some measures of policy, these can then be applied to an empirical model of wage behaviour. The form of wage equation chosen is the real wage resistance model since the empirical record (eg. Henry et al., 1976) suggests that this is one of the better empirical descriptions of aggregate wage behaviour. In obtaining empirical estimates problems of expectations and wage catch-up are dealt with and the results also reveal differences between wage models based on the exogeneity of incomes policy and those models which assume it to be simultaneously determined.

The problems of policy endogeneity are dealt with in Chapters 7 and 8. The former gives an outline of the general literature relating to policy reaction functions and its limitations whilst Chapter 8 applies a modified version of the reaction function based on the piece-wise quadratic function of Friedman (1975) to the incomes policy measure. In order to estimate these reaction functions the issue of structural constancy is discussed.

Having obtained a measure of policy, a description of policy formation through the reaction function approach and an empirical estimate of the effect of incomes policy on wage behaviour, the results are applied through the use of a small scale simulation model.[1]

1.3 Definition of incomes policy

Problems in defining incomes policy have bedevilled much of the empirical literature on incomes policy which have tended to characterise policy as either "on or "off". For example, Parkin (1972) regards policy as "on" between 1961(3) and 1969(1) whereas Parkin *et al.*(1976) regard policy as "off" between 1962(3) and 1966(2) and after 1967(2); Henry *et al.* (1976) treat policy as "on" from 1972(4) to 1973(4) whereas Henry and Ormerod (1978) regard it as "on" until 1974(1). Periods of wage freezes such as that of 1966(3) - (4) and 1972(4) - 1973(1) are fairly consistently regarded as policy "on" periods (see Table 1.1) but decisions on the status of policy in other historical periods are determined by no clear rule. Often, in fact, the procedure is to follow the example of some previous author (eg. Smith, 1968) whose own procedure has no precisely stated criteria. It is clear that to model and evaluate incomes policy requires some general understanding of what is meant by incomes policy. Clegg (1979) defines incomes policy as "... an attempt - usually by a Government - to alter the national level of wages and salaries". (p.345).

However, this definition overlaps incomes policy with other economic policy instruments, notably monetary and fiscal policies, since these can also be seen as operating on the level of wages, whether through the level of unemployment, through real wages or through expectations. By incomes policy we must therefore mean some policy action designed to influence wages through some direct influence on wage determination. Even if other policy changes have the effect on wages as their principal aim, this is achieved initially through markets other than that of labour. For example, increasing real incomes by reducing direct taxation operates initially through fiscal policy and the goods market. A suggested topology for incomes policy is as follows:

(i) short term intervention in the wage determination process, such as by temporary wage controls or wage freezes;

(ii) educational and informative action designed to influence the labour market. These measures might include the preparation and publication of "expert" reports which outline the implications for the economy of alternative rates of growth of money wages. The aim of these measures would be to achieve some consensus on the acceptable growth of money wages;

(iii) the setting of mandatory or voluntary guidelines on wage growth, regardless of whether there is accompanying price control or profit restraint. Thus price controls are neither a sufficient nor necessary condition for the existence of an incomes policy;

(iv) the operation of some co-ordinated system of wage determination, with or without direct government intervention, or through some form of compulsory arbitration procedure;

(v) long-term measures such as institutional engineering. These might include facilities for mediation, sanctions against unofficial disputes, etc.

The discussion of policy in Chapter 4 reveals that most of the policies followed by the UK Government between 1962 and 1979 fall into (i) and (iii) although in the early part of the period some attempts were made to operate via category (ii) and various attempts have been made to establish some co-ordinated system of wage determination through the introduction of the National Board for Prices and Incomes in the mid-1960s and the Pay Board in the early 1970s. However these bodies degenerated rapidly into supervisory bodies concerned with overseeing policies which fall into class (iii). Although arbitration procedures have been an important element in sorting out individual wage problems there has been no general arbitration system as an integral part of the wage determination in the manner recently suggested by Meade (1982). Long-term measures as defined by (v) have been notable by their absence.

The definition of incomes policy given by the above classification includes implicit policies as well as explicit policies. Many of the measures included under (ii), (iv) and (v) might well be regarded as an implicit rather than explicit policy. The existence of a wage norm or guideline is not therefore a necessary condition for an incomes policy to exist although its absence does complicate the construction of a quantitative index of policy.

It should be noted that the topology of incomes policy does not include measures aimed at restraining cost pressures in specific sectors. Thus, holding back wage increases in the baking industry, say, if unaccompanied by comparable action in other sectors is not designated as incomes policy. In practice, of course, wage negotiations are sequential rather than simultaneous so that it might be argued that controlling wages in some particular sector could be construed as incomes policy if wages in other sectors were expected to be influenced by wages in this leading sector. Although post-war governments have been well aware of the comparability issue in wage determination and have often commenced any intervention on wage settlements in the initial phase of a wage-round in order to influence wage settlements later on, there is little evidence that they have taken the leading sector theory of wages seriously enough to limit their intervention to one or two major settlements.[2]

One of the problems in the suggested classification is an extension of this sectoral case and concerns the treatment of the public sector. It has frequently been argued that since the Government must always take some view as to the acceptable level of renumeration in the public sector then it must always be operating an incomes policy. However, Clegg's definition clearly states incomes policy as relating to the level of national wages and salaries. Both because of the size of the public sector (accounting for over one-quarter of employment in 1981) and because of the interdependence between public and private sector pay through comparability issues, public sector incomes policy must be seen as a form of national incomes policy applied to a large but not complete section of the labour force. However, this does not mean that incomes policy is therefore always seen to be "on" as the criteria for defining incomes policy still stand. Thus decisions over public sector pay must be seen to follow a clear general strategy rather than applied case by case to parts of the public sector. Similarly, a public sector expenditure policy operating through the imposition of cash limits but with no view as to the mix of real expenditure and inflation does not constitute an instance of incomes policy. Rather it is a form of fiscal policy.

The analysis of policy since 1962 suggests that, using the above criteria, there has almost always been some form of incomes policy in operation, the main exception being the very first few months of the Conservative administration in 1970. The main issues that arise therefore are not whether policy was "on" or "off", since it was nearly always "on", but the extent to which it was applied in different periods.

Footnotes to Chapter 1

1. This work concentrates on incomes policy and its impact on wage determination. It does not consider the independent role of any prices policy which, in any event, has been rare over the period.

2. The work by Elliott (1976) shows that there is no regular wage-round in that settlements tend not to occur in the same sequence in each year although there is some support for the idea that settlements which occur early in the pay-round (which probably begins in September/October of each year) do strongly influence succeeding wage demands in other sectors.

CHAPTER 2 REVIEW OF THE EMPIRICAL TREATMENT OF INCOMES POLICY IN WAGE EQUATIONS

As noted in Chapter 1, the exact classification of periods of economic history as being periods of policy "on or "off" has been subjective rather than being based on a set of objective criteria. Some (eg. Parkin et al., 1976) have included only periods with zero norms backed by legislative powers ("freezes") whilst others (eg. Henry and Ormerod, 1978) have included periods of "voluntary restraint".

2.1 The real wage resistance model

For the purposes of the research in this thesis a real wage resistance model of money wage determination is adopted. This is based on the original paper by Sargan (1964) which was updated and popularised by Henry et al. (1976). Usually in the literature the real wage resistance model has been postulated as emerging from a bargaining framework where trade unions are assumed to strive for a given real wage in the light of expected price developments. Thus following Henry et al. we have the target money wage, from the union side, as given by:

$$W = W_{t-1} \cdot (P/P_{t-1})^{e} \cdot \left[\frac{W/P^{\,d}}{W_{t-1}/P_{t-1}} \right]^{\lambda} \qquad \ldots.(2.1)$$

where W refers to money wages, P to prices, e denotes the expected value of a variable and d its desired value. The employers' reaction enters the real wage resistance framework by the inclusion of a demand variable, usually the level of unemployment, although this may also be interpreted as an indicator of union bargaining strength. Adding the unemployment term and taking logarithms gives (2.2).

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$$\log W - \log W_{t-1} = \log \left(P/P_{t-1}\right)^{e} + \lambda \left[\log \left(W/P\right)^{d} - \log \left(W_{t-1}/P_{t-1}\right)\right] + \theta \log U \qquad \text{.... (2.2)}$$

where U refers to the level of unemployment.

The formulation of (2.2) implies that, for a given level of expected price inflation and unemployment, any deviation of actual real wages from their desired level $(W/P)^d$ must eventually be made up. In other words, the formulation is that of partial adjustment to any given desired or target level of real wages.

We can now see that if λ, the partial adjustment of actual to desired real wages, is zero, then the real wage resistance model (RWR) collapses to the familiar augmented Phillips curve (Friedman, 1975):

Thus,

$$\log \left(W/W_{t-1}\right) = \log \left(P^{e}/P_{t-1}\right) + \theta \log U \qquad \text{.... (2.3)}$$

Thus the fact that some of the previous empirical work (eg. Lipsey and Parkin, 1970) has used the augmented Phillips curve whilst others (eg. Henry *et al.*, 1976) have used the real wage resistance model does not prove a problem for our taxonomy of models since the augmented Phillips curve (APC) can be seen as a specific form of the more general real wage resistance model (RWR).

In both the RWR and APC outlined as (2.2) and (2.3) the term in expected price inflation has a unit coefficient. Whilst this has often been justified by an appeal to money illusion (eg. Friedman, 1975) it has been seen by some as an empirical question, especially in cases where some proxy (often actual past price inflation) has been used for expected price inflation.[1] In addition, Artis and Miller (1979) have shown that a unit coefficent on price inflation is not a necessary condition for absence of money illusion under the real wage resistance model.

Therefore, more general versions of the real wage resistance model and the augmented Phillips curve can be written as (2.4) and (2.5)

Real wage resistance (RWR)

$$\log\left({}^{W}/_{W_{t-1}}\right) = \beta \log\left({}^{P^e}/_{P_{t-1}}\right) + \lambda\left[\log({}^{W}/_{P})^d - \log\left({}^{W_{t-1}}/_{P_{t-1}}\right)\right] + \theta \log U \quad \text{......(2.4)}$$

Augmented Phillips Curve (APC)

$$\log\left({}^{W}/_{W_{t-1}}\right) = \beta \log\left({}^{P^e}/_{P_{t-1}}\right) + \theta \log U \quad \text{.....(2.5)}$$

One of the major problems with the real wage resistance model concerns the determination of the desired or target real wage. Henry <u>et al</u>. (1976) assume that it grows at some constant rate, γ, so that we can write (2.4) as:

$$\log\left({}^{W}/_{W_{t-1}}\right) = \beta \log\left({P^e}/_{P_{t-1}}\right) - \lambda \log\left({}^{W_{t-1}}/_{P_{t-1}}\right) + \theta \log U + \gamma\lambda T + \mu\lambda \quad \text{....... (2.6)}$$

where T = a time trend

and where $\log(W/_{P})^d = \mu + \gamma T$

or $\log\left({}^{W}/_{W_{t-1}}\right) = \alpha_0 + \alpha_1 \log\left({}^{P^e}/_{P_{t-1}}\right) + \alpha_2 \log\left({}^{W_{t-1}}/_{P_{t-1}}\right) + \alpha_3 \log U + \alpha_4 T \quad \text{............ (2.7)}$

where $\alpha_0 = \mu\lambda$

$\alpha_1 = \beta$

$\alpha_2 = -\lambda$

$\alpha_3 = \theta$

$\alpha_4 = \gamma\lambda$

and minus the ratio of the parameters on lagged real wages (α_2) and on the time trend (α_4) gives γ, the trend rate of growth of desired real wages. In Sargan's original formulation real wages were defined as pre-tax wages whereas following Henry et al. (1976) real wages have generally been taken to be post-tax real wages. If these are defined to be the product of real wages and the ratio of post-tax to pre-tax wages (the 'retention ratio') (2.7) can be re-written as:

$$\log({}^{W}/{}_{W_{t-1}}) = \alpha_0 + \alpha_1 \log ({}^{P^e}/{}_{P_{t-1}}) + \alpha_2 \log ({}^{rW}/{}_{P})_{t-1}$$

$$+ \ \alpha_3 \log U + \alpha_4{}' T \qquad \text{.........} \ (2.8)$$

where r is the retention ratio

and $\alpha_4{}'$ is now $\gamma'\lambda$, i.e. related to the trend growth of the post-tax target wage.

Criticisms of the RWR model have often centred on the apparent immutability of this target real wage and the empirical support for RWR runs into problems in the late 1970s when the equations apparently shift (Henry and Ormerod, 1978). This apparent shift in the relationship has sometimes been attributed to the success of the incomes policy of 1976 and 1977 in reducing real wages, in which case one might expect the original equation to reassert itself once these effects have passed. Alternative explanations have been along the lines that general economic events and in particular the slow-down in the rate of growth of productivity had convinced trade unions that the previous desired rate of growth of real wages was now unobtainable and therefore that the relationship had shifted permanently. Other explanations are possible but the general problems relating to the use of the time trend make any firm conclusion almost impossible.

Although the most common background to RWR is the bargaining approach it has been argued that the model is consistent with alternative theoretical and empirical backgrounds. In particular, Parkin (1979) argues that the model is indistinguishable from an excess supply model of real wages since the presence of high real wages would, according to neo-classical theory, lead to a downward pressure on wages through excess supply. He argues that this is supported empirically by an inverse relationship between real wages and wage inflation. Kuh (1967) has advanced a similar explanation whereby the post-tax real wage represents the supply side of the labour market and the time trend average productivity growth and the demand side. The standard form of RWR does not distinguish easily between the excess supply approach and the bargaining approach. The most that one can say is that it is a reduced form of labour market adjustment which may be consistent with more than one theoretical model of labour market behaviour.

2.2 Taxonomy of policy effects

The major routes by which incomes policy might be thought to affect wage inflation are as follows:

(a) dummy shift approach. Here policy operates by changing the intercept term (α_0) so that the entire equation shifts uniformly for the duration of the policy. Estimates of the size and significance of the dummy variable are then interpreted as a measure of the influence of policy.

(b) dummy slope approach. Here policy may change some or all of the remaining parameters (α_i, i=1....n) with estimates of these coefficients again being used to evaluate the influence of policy.

(c) simulation approach. This is not a modelling device as such since it is based on using an equation estimated in periods of policy "off" to simulate wage inflation in periods of policy "on". The policy "on" model is not defined and the impact of controls is measured as the difference between the actual and simulated values.

(d) on-off approach. This is a generalisation of (a) and (b) where different equations are estimated for periods of policy "on" and policy "off" but with identical sets of explanatory variables. Structural differences between the models are used to indicate the significance and impact of controls under the assumption that the policy "off" model is the true wage model.[2]

(e) difference in variable approach. Here the effects of the explanatory variables are allowed to change under policy "on". Note however that our definition of incomes policy requires this to be a direct effect on the labour market so that we are concerned with, say, the implications of different price expectations under the imposition, or anticipation of imposition, of wage controls rather than the fact that incomes policy may enable the economy to be run at a higher level of activity and hence unemployment may be lower during policy "on" periods. If the target real wage itself is influenced by policy,however. then this is a'true' policy effect.

(f) new model approach. This is an extension of the "on/off" approach of (d) but where a different set of explanatory variables may appear in the policy "on" equation. As with (d) estimates of the significance of controls are given by the difference between the two models.

(g) general model approach. This is an extension of the new model approach (f) where the "on/off" equations are unified into a single formulation of aggregate wage determination where the values of some of the variables in the general equation indicate the strength of incomes policy. This continuous approach then drops the distinction between policy "on" and "off".

Most empirical assessments of incomes policy in the UK have been based on methods (a) to (d) (see Table 2.1). The dummy shift approach has been most common and has been used by Smith (1968), Parkin _et al_.(1976), and Henry _et al_. (1976) amongst others. The dummy variable generally takes on the value of unity in policy "on" episodes and zero in periods of policy "off" (an exception is Smith , 1968) where the variables are scaled in proportion to the length of policy period). The "on/off" approach (d) has been used by Lipsey and Parkin (1970) and by Sargan (1980).

With the exception of Sargan (1980), who uses the instrumental variable estimation technique, all the previous UK studies have treated incomes policy as exogenous in their analyses of aggregate wage determination.

A recent study by Lawson (1982) which has been developed in parallel but independently of the present study attempts to quantify incomes policy by a similar real wage pressure method as this study but using annual data. However the measure of policy derived is not continuous (for example it ignores the 1972/3 experience); it has no separate role for the intensity of policy; the incomes policy variable merely enters as an additional influence; and policy is treated as exogenous.

2.3 Limitations of the existing treatment

The almost continuous presence of incomes policy in the 1960s and 1970s limits the ability to estimate a policy "off" model and hence precludes the on/off approach (d) as well as the simulation approach (c). It is a common feature of some of the previous studies that the techniques used could, with some ingenuity, distinguish between different periods of policy and could therefore provide some ex-post evaluation but these models are unable to give any reasonable guidance to the ex-ante effects of incomes policy. Modelling treatment based on these approaches are therefore not feasible unless policy "on" periods are relatively rare.

The dummy variable approach ((a) and (b)) can deal more easily with differences between policies whereas the policy "on"/"off" approach treats all policy "on" periods as implicitly of the same strength.

The dummy shift approach has been used by Henry and Ormerod (1978), amongst others, to distinguish between different phases of policy by specifying different dummy variables for each distinct phase of policy. Even so it is inevitable that certain policy periods are either lumped together (with the corresponding homogeneity assumption of policy imposed) or ignored altogether in order to make the estimation tractable.[3] To generalise the approach to distinguish finely between policy episodes runs the problem of spurious results since the coefficients on the dummy variables will not only measure

Table 2.1 **The Methodology Adopted in the Literature**

Date	Author	Period covered	Methodology	No. of policy periods	Wage variable
1968	National Board for Prices and Incomes	1946-66	Dummy variable	2	annual wages
1970	Lipsey/Parkin	1948-68	Split sample	2	wage rates centred 4 qtr. difference
1968	Smith	1948-67	Dummy variables*	4	wage rates, 4 qtr. difference
1972	Parkin	1948-69	Split sample	2	wage rates
1976	Parkin, Sumner and Ward	1956-71	Dummy variables	2	wage rates
1976	Henry, Sawyer and Smith	1948-74	Dummy variables	3	wage rates
1977	Sheriff	1959-73	Dummy variables	14†	1 qtr. difference earnings (manufacturing)
1978	Henry and Ormerod	1961-77	Dummy variables and catch-up dummies	9	wage rates 1 qtr. difference
1980	Sargan	1952-73	Split sample and dummy variables**	2	wage rates 1 qtr. difference

* scaled in proportion to the length of the policy period

** dummy variables are treated as endogenous

† including announcement dummies

any policy effect but will also capture any influence from unidentified factors and random errors within the wage equation.[4] Even the more limited approach of Henry and Ormerod (1978) poses particular problems for ex-ante estimation of policy effects, since if more than one phase of policy is distinguished, which is the most relevant for future policy evaluation ? Problems with timing effects bedevil both the dummy variable and the policy "on/off" approaches. In the simple case where there are no timing effects from policy itself the presence of serial correlation in the residuals will invalidate the sample separation.

Suppose the policy "off" model is defined to exist until period t and to recommence in period t + n with the policy "on" model existing between periods t + 1 to t + n - 1. If there is serial correlation of order i in the underlying wage model then an extra i observations should be excluded from both the policy "on" and policy "off" periods which are then defined as policy "on" from t + i + 1 to t + n - 1 and policy "off" from t + n + i considerably reducing the already small number of degrees of freedom. Similar considerations apply if the true policy "on" and "off" models differ and the policy "off" model contains lagged variables. Pre-announcement or anticipation of controls and possible catch-up after controls also make separation of the sample period into different policy regimes somewhat complex. Prior announcement can relate either to the imposition of controls or to their ending. Whilst the former has been rare in the UK the latter has occurred frequently. This then gives an incentive to shift wage bargains from the period of controls into the post-control era.[5] The possible general anticipation of tighter or looser controls implies that attempts to estimate a policy "off" model without allowing for the possible resultant bunching of wage settlements will lead to misleading conclusions regarding the efficacy of the particular policy episode. Thus, if wage settlements were brought forward in time in order to avoid a period of tighter wage controls one would observe a relatively high rate of wage inflation prior to the controls and a relatively low rate during the period of tighter controls, leading to the conclusion that the tightening of policy had been successful in reducing wage settlements even if the true result were that policy had merely shifted the pattern of wage settlements through time.

Similar considerations apply to the ending of a relatively severe phase of policy. Here again the conclusions regarding the success of policy may merely relate to the shifting of settlements over time.[6] Of course, it is also possible to confuse the shifting of settlements due to policy with genuine policy catch-up. By policy catch-up is meant some form of compensation in wage settlements for a lowering of wages during the policy. Henry and Ormerod (1978) include dummy variables in an attempt to measure policy catch-up and their work is therefore subject to the criticisms noted above.

The general criticism of both the sample separation approach (policy "on/off") and the dummy variable approach concerns the inability of these methods to deal with the timing problems of policy without either reducing the already scarce (if not non-existent) degrees of freedom for policy-off analysis or causing an explosion in the number of dummy variables introduced with consequent danger of spurious results. If one adds the observation that the time period over which policy catch-up might be spread is probably an empirical matter rather than one that can be decided upon *a priori* the case for an alternative approach is strengthened.

Such an alternative approach is described in Chapter 3. It is based on a more general approach to policy measurement which avoids the proliferation of dummy variables but also stresses the case-study element of incomes policy in dealing with timing problems. At this point it is necessary to make some further elaboration of the modelling of policy catch-up factors in the real-wage resistance model.[7]

In the standard RWR model the desired real wage is exogenously set. The basic presumption of this thesis is that incomes policy, if effective, operates through reducing real wages at least initially since empirical work on pricing behaviour (e.g. Godley and Nordhaus, 1972) shows that prices respond only with a lag to a reduction in wage costs.[8] Recognition of these facts explains the general unease with which trade unions hold incomes policy although fears of losing their right to bargain freely, and hence one of their historically important roles, may also be relevant to this position.

The picture may be clarified a little by the use of a simple algebraic model comprising a wage equation (omitting the real wage resistance terms at first) and a price mark-up equation.

$$\dot{w}_t = a_0 + a_1 \dot{p}_t + a_2 u_t + \gamma$$

$$\dot{p}_t = \theta_0 \dot{w}_t + \theta_1 \dot{w}_{t-1} + \theta_2 \dot{w}_{t-2} + \phi \dot{c}_t$$

where dots signify percentage rates of change ; $\dot{p}_t$ is price inflation; the term in $\dot{c}_t$ reflects cost changes other than wages and γ is an exogenous shock.

Allowing for wage-price feedbacks, the first period impact of an exogenous shock on wages of γ is $\gamma / (1-\alpha_1\theta_0)$ whilst the impact on prices is $\gamma \cdot \theta_0/(1-a_1\theta_0)$ with a consequent effect on real wages of $\gamma(1-\theta_0)/(1-a_1\theta_0)$. The smaller the first period weight on wage costs in the price equation (θ_0) the greater the effect on real wages and in the limit where $\theta_0 = 0$, i.e. current wage costs have no effect on prices, then the change in real wages is identical to the exogenous shock. For non-zero values of θ_0 the smaller the feedback from prices to wages (i.e. the lower the coefficient a_1) the larger the impact on real wages of a given exogenous shock. Now consider the longer run results.

The long-run effect on wages is $\gamma/(1-a_1\sum_{i=0}^{2}\theta_i)$ and $\Sigma\theta_i$ can be interpreted as the share of labour costs in total output. Given the existence of other costs $\Sigma\theta_i$ will be less than unity. The long-run effect on prices will be $\gamma\Sigma\theta_i/(1-a_1\Sigma\theta_i)$, and the consequent real wage impact $\gamma(1-\Sigma\theta_i)/(1-a_1\Sigma\theta_i)$.[9] The effects are illustrated in Table 2.2 using alternative sets of plausible parameter estimates for θ_0, the weight on wage costs in the price equation for the current period, and for a_1, the wage response to a change in prices. The table shows the importance of a_1, in magnifying the wage-price and real-wage response for the given exogenous shock, both in the short-run and over the long-run. Increasing the weight on the current period's wage costs does not of course affect the long-run results but does imply a smaller change in real wages in the short run following the shock.

These results are dependent on the assumption that other cost factors (e.g. indirect taxes and import costs) remain unchanged. Artis and Miller (1979) consider the case where only wage and import costs enter the price equation and where the exchange rate floats to compensate exactly for changes in domestic price inflation. The terms of trade changes implicit in the results can no longer occur. This additional assumption is equivalent to treating $\Sigma\theta_i$ as equal to unity. Clearly there is no real wage consequence now in the long run but if the coefficient a_1 equals unity wage inflation accelerates. In practice of course, the presence of other costs (like indirect taxes) will mean that $\Sigma\theta_i$ will still remain below unity even when the exchange rate floats in such a manner. In addition, however, one must note that the empirical evidence on exchange rate behaviour suggests that full compensation for changes in domestic inflation takes some considerable time, if full compensation occurs at all (see the contributions in Eltis and Sinclair, eds., 1981).

Now let us introduce a real wage element into the basic wage equation.

$$\dot{w}_t = a_0 + a_1 \dot{p}_t + a_2 u_t + \gamma + a_3 (W/P)_{t-1} + a_4 T$$

With only real wages entering the wage equation in a lagged form the implication of an exogenous shock for wages and prices in the first period is equivalent to that derived using the augmented Phillips curve above. However in the second period there is an additional influence on wages as wages increase in order to restore some of the earlier loss in real wages below the exogenously set target (T). The extent of real wage catch-up depends on the absolute magnitude of the coefficient a_3 since this is in effect an adjustment coefficient relating the level of real wages to its target.

As in the case of the augmented Phillips curve the equilibrium real wage properties of the wage equation depend on the magnitude of the coefficient on price inflation (a_1). If it is less than unity the wage equation implies that higher price inflation continuously lowers real wage growth. A permanent shift in γ can lead to different real wage growth but a temporary shock will be eroded by

Table 2.2 Effect on Wages and Real Wages of a once-for-all 10 per cent shock to Wages

Augmented Phillips Curve

	Wages			Real Wages		
	short-run	long-run		short-run	long-run	
		$\Sigma\theta_i=0.8$	$\Sigma\theta_i=1.0$		$\Sigma\theta_i=0.8$	$\Sigma\theta_i=1.0$
$\theta_0=0.2$, $a_1=0$	10.0	10.0	10.0	8.0	2.0	0
$\theta_0=0.2$, $a_1=0.5$	11.1	16.7	20.0	8.9	3.3	0
$\theta_0=0.2$, $a_1=1.0$	12.5	50.0	∞	10.0	10.0	0
$\theta_0=0.5$, $a_1=0.5$	13.3	16.7	20.0	6.6	3.3	0

the integral adjustment due to the lagged real wage term. Under circumstances where the exchange rate fully compensates for changes in domestic inflation, however, even permanent shifts cannot change real wages although attempts to do so may lead to ever-accelerating inflation (see Artis and Miller, 1979).[10]

The implication of these results is that there is a built-in element of wage catch-up within the wage equation following an exogenous shock, such as the imposition of an incomes policy. It is therefore inappropriate to include additional catch-up terms in empirical analysis unless it is wished to test one or other of the following hyptheses.

(a) that wage catch-up following an incomes policy has a different adjustment profile to ordinary real wage catch up, in which case the parameter a_3 should be treated as variable.

(b) that wage demands following an incomes policy react to nominal wage demands and not just real wage demands so that all lost nominal wage increases under the policy are made good irrespective of the extent to which real wages were affected. This hypothesis therefore rests uneasily within the real wage resistance framework.

Catch-up dummies were used by Henry and Ormerod (1978) in their study of wage inflation. However, their results (discussed in further depth in section 2.4) have often been misinterpreted. In the terms of their analysis a positive catch-up dummy of similar order of magnitude to the original policy effect does not imply that nominal wage growth accelerates in order to restore the level that would have been attained under conditions of policy "off", as has often been concluded in summaries of the Henry/Ormerod study. Rather, since their analysis was in terms of the rate of acceleration of wage growth, significant dummy variables merely imply that wage growth reverts to its underlying policy "off" level.

Use of additional dummies to represent so-called "wage catch-up" is therefore fraught with difficulties. Not only may they measure timing effects which are legitimately part of policy (i.e deferred settlements) but they are incapable of distinguishing between hypotheses such as those noted above. In addition, they are not required within a real wage resistance framework in order to allow for real wage catch-up. To these criticisms of dummy catch-up variables must be added the observation that timing effects may operate and the extent to which they deviate from the built-in effects are often likely to vary from policy to policy. However, whilst the case-study element in estimating these effects is important they can be set into a more general framework. The major problem with the dummy variable approach, whether it is applied to policy effects or policy catch-up effects is that it is either too specific (by including a multiplicity of dummy variables) and therefore loses any generality or it is too general (by including relatively few dummy variables) and therefore loses useful information relating to different policy episodes. The dummy variable approach is also highly subjective both in its assessment of which periods were "on" or "off" and in the relative strength of some phases of policy relative to others.

Wage settlements

A common criticism of aggregate wage studies concerns the measurement problem. Pencavel (1982) argues that "where the time pattern of wage settlements differs across sectors of the economy, and where no account is taken of this non-synchronous pattern, then aggregate quarterly wage change equations will be plagued with aggregation bias". He goes on to argue that.... "under these circumstances, the coefficients of these aggregate wage change equations should not be expected to display any stability with respect to the additions or deletions of observations". Problems measure timing effects which are legitimately part of policy (i.e deferred settlements) but they are incapable of distinguishing between hypotheses such as those noted above. In addition, they are not required within a real wage resistance framework in order to allow for real wage catch-up. To these criticisms of dummy catch-up variables must be added the observation that timing effects may operate and the extent to which they deviate from the built-in effects are often likely to vary from policy to policy. However, whilst the case-study element in estimating these effects is important they can be set into a more general framework. The major problem with the dummy variable approach, whether it is applied to policy effects or policy catch-up effects is that it is either too specific (by including a multiplicity of dummy variables) and therefore loses any generality or it is too general (by including relatively few dummy variables) and therefore loses useful information relating to different policy episodes. The dummy variable approach is also highly subjective both in its assessment of which periods were "on" or "off" and in the relative strength of some phases of policy relative to others.

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Expectations

Expectations elements in the modelling of incomes policy enter in two main ways. First there is the possibility, referred to earlier, that expectations relating to the imposition of a tighter period of controls, or to the easing or dismantling of controls may influence wage settlements. The earlier analysis suggests that the operation of these effects may lead to erroneous conclusions regarding the efficacy of the policy by either bringing forward settlements into the pre-policy stage or by deferring them to the post-policy era.[11] Second, there is the issue concerning the measurement of price expectations in the wage equation. A standard device has been to proxy expected inflation by past or current price inflation or to model them adaptively.[12] Some attempts have been made to measure price expectations by survey data[13] whilst others have attempted to model expectations rationally (Ormerod, 1982). Most methods of measuring price expectations have been mechanical.

It is argued here that the lack of 'rationality' in the formation of price expectations in the context of aggregate wage equations is not a great deficiency since the labour market is perhaps the sector of economic activity where rational expectations are least likely to be formed. However, it seems logical to admit that the formation of price expectations may be influenced to some degree by the imposition of incomes policy.

Endogeneity

Most studies of incomes policy at the aggregate level have treated the imposition of incomes policy as exogenous. However, as Wallis (1971)comments

> ".... the decision to impose an incomes policy is not independent of the values of the variables in the model and .... policy itself must surely also become a jointly dependent endogenous variable. The relationship between the rate of price and wage inflation and the imposition of a policy of restraint is equally a feedback relationship. The division of the sample period into policy-on and policy-off periods is not arbitary, but is related to actual or expected rates of inflation".

Similar criticisms apply to the dummy variable approach where the variables are estimated on the assumption that they are exogenous variables.[14] The standard econometric result from this simultaneous equation bias is that the parameter estimates of the equation are biased and inconsistent. The extent and direction of bias will depend on the true relationship between incomes policy variables in the basic wage equations and the decision to impose policy. In a simple model where wage inflation depended on an incomes policy variable and where the value of the incomes policy variable itself depended proportionally on wage inflation then bias would be positive and the coefficient on the incomes policy term in the wage equation would be biased towards zero, i.e. it would understate the true influence of incomes policy.[15] Even were the extent of bias in the single equation estimates of the wage equation small then omitting the potential feedback between expected price inflation and the decision to impose or tighten an incomes policy could lead to possible misleading results from forecasting and simulation analysis of the full macroeconomic system. For example, the existence of a policy feedback would make the likelihood of a wage and price explosion less likely whereas such a situation is not precluded by some of the existing UK macroeconomic models.[16]

2.4 Results from the empirical literature

The spirit of the empirical literature on the effects of incomes policy on wage determination in the UK has been to make a global assessment as to whether incomes policies are effective or not. This is particularly prevalent in studies which use the "on /off" methodology such as Lipsey and Parkin (1970). In this approach all incomes policies are treated as homogeneous. The most frequently used approach in the recent empirical literature has been the intercept dummy variable approach and although this can and has been used to test for differences between alternative phases of incomes policy the interpretation of results has been one which classifies incomes policies in general as effective or otherwise. However, one might expect a very much smaller effect from a mild incomes policy which was applied very weakly compared with a severe incomes policy which had considerable statutory backing. To attempt to conclude from evidence from the range of policies implied by these two extremes that incomes policy was an effective policy instrument or not is misleading.

In many instances in the literature the reader is left to interpret the effects of incomes policy from the statistical estimates of the wage equation, with little attempt by the author to derive incomes policy estimates. In some cases (e.g. Henry and Ormerod, 1978) this has led to some misinterpretations of the results.

In Table 2.3 estimates of policy influence from past studies are presented. Those studies which use the "on/off" approach derive policy effects by using policy-off equations to predict wages in policy-on periods and then comparing these predictions with the actual behaviour of wages. The conclusions of Lipsey and Parkin (1970) were that incomes policies had no restraining effect on wage inflation in the period post-1961 (although the Cripps' incomes policy of 1948-50 was found to have reduced wage inflation by 1.8 per cent per annum on average). The study by Parkin (1972) using a similar methodology again found no restraining influence in either the period between 1961 and 1964 or between 1964 and 1968.[17] These two pieces of work, together with those of NBPI (1968), Smith (1968) and Parkin _et al_.(1976) cover the first generation of incomes policies up to 1968/9. The studies by Smith and Parkin _et al_. use the dummy variable approach but whereas Smith identifies four separate periods, Parkin _et al_.only include the period of the pay pause (1961(3) - 62(2)) and the period from 1966(3) to 1967(2). Parkin _et al_. use dummy variables taking either the value of unity (policy-on) or zero (policy-off) whereas Smith also experiments with dummy variables which are scaled in proportion to the length of the policy. He finds that weekly wage rates were reduced significantly in 1961 and 1962 by over 1½ percentage points in contrast to the 'perverse' effect derived by Parkin _et al_.. Smith finds, however, a perverse influence from incomes policy between 1962 and 1964 but statistically significant influences of 1 per cent per annum and 1¼ per cent per annum between 1965 and 1966 and between 1966 and 1967 respectively. Using proportional dummies makes very little difference to these estimates but policy influence is much less marked when hourly wage rates are the dependent variable in the wage equation. No statistically significant effects emerge in the post-1961 era with the policy estimate for 1961-2 reduced to under ½ per cent compared with over 1½ per cent on weekly wage rates and that on the period 1966-7 reduced from 1¼ per cent per annum to ¾ per cent. However use of the regular or proportional dummy now makes a difference with the policy effect for 1961-2 increasing to 1 per cent and that for 1966-7 to over 2 per cent.

The study by the NBPI (1968) uses annual data and distinguishes between tight and moderate policy; 1965 being classed as the latter and 1961-2 and 1966 as the former. The estimated policy effects are not statistically significant but the coefficients are almost identical at around 1 per cent. The study by Parkin et al. (1976) includes only two dummy variables; the first covering the pay pause of 1961-2 and the second the period 1966(3) - 1967(2). Neither policy dummy proves statistically significant, the estimate for the first policy phase being positive whilst the second phase has a coefficient of the expected negative sign which implies a reduction in wage inflation of just over 1 per cent.

All the studies cited so far use the Phillips curve as the basic form of wage equation. However, despite regular resuscitation, confidence in the Phillips curve as an empirical description of wage behaviour was low in the 1970s and the study by Henry et al. (1976) turned to the real wage resistance model. Henry et al. (1976) also use the dummy variable approach and extend the estimation period to 1974. They distinguish between two periods of policy after 1961, the wage-freezes of 1966 (1966(3) - 1967(2)) and of 1972 (1972(4) - 1973(4)). Only the former policy period emerges as statistically significant with an effect of over 1 per cent.

Sheriff (1977) uses a neo-classical model of wages whereby wages depend on output, employment, prices and time. The model is applied to manufacturing industry using the intercept dummy approach. However, Sheriff goes one step further than many of the other studies by identifying fourteen separate dummies, of which one-half refer to announcement effects. A price equation is also specified and the model estimated simultaneously over the period 1959(1) to 1973(4). Two of the announcement dummies are significant - those for the freeze of 1966(3) and for the freeze of 1972(4). However, whilst the coefficient on the former is negatively signed that on the latter is positive. Sheriff explains this result by differences in the timing of the policy announcement within the quarter. However, Sheriff's definition of the announcement effect is perhaps ambiguous. Whereas one interpretation of the announcement effect would be that effect on wages which occurs between declaring the intention to apply the policy and actual commencement of the policy, an alternative interpretation used by Sheriff is whether the impact effect on wages differs from the continuous effect. Both the significant announcement effects have comparable magnitudes of response, namely 3 per cent. Of the seven continuous dummies, three are statistically significant: those covering the period 1962(3) - 1964(4); 1966(4) - 1967(1); and 1968(3) - 1969(4). Two of the announcement dummies are almost identical in magnitude to the succeeding continuous dummies (1961(3) and 1966(3)). It is difficult to see why the period between 1967(2) and 1968(2) was excluded from the analysis since a tighter policy was clearly in operation then than in the following eighteen months. Although the Sheriff approach is less restrictive in its coverage of policy it does lead to the problem of multiplicity of dummies referred to earlier. For example, Sheriff uses three separate dummy variables in 1973 to cover only four observations with the consequent problem that the implied policy estimates will also include random errors.

Henry and Ormerod (1978) also use a real wage resistance model and include observations from 1961 to 1977(2). However the form of the equation that they prefer is a differenced form of also specified and the model estimated simultaneously over the period 1959(1) to 1973(4). Two of the announcement dummies are significant - those for the freeze of 1966(3) and for the freeze of 1972(4). However, whilst the coefficient on the former is negatively signed that on the latter is positive. Sheriff explains this result by differences in the timing of the policy announcement within the quarter. However, Sheriff's definition of the announcement effect is perhaps ambiguous. Whereas one interpretation of the announcement effect would be that effect on wages which occurs between declaring the intention to apply the policy and actual commencement of the policy, an alternative interpretation used by Sheriff is whether the impact effect on wages differs from the continuous effect. Both the significant announcement effects have comparable magnitudes of response, namely 3 per cent. Of the seven continuous dummies, three are statistically significant: those covering the period 1962(3) - 1964(4); 1966(4) - 1967(1); and 1968(3) - 1969(4). Two of the announcement dummies are almost identical in magnitude to the succeeding continuous dummies (1961(3) and 1966(3)). It is difficult to see why the period between 1967(2) and 1968(2) was excluded from the analysis since a tighter policy was clearly in operation then than in the following eighteen months. Although the Sheriff approach is less restrictive in its coverage of policy it does lead to the problem of multiplicity of dummies referred to earlier. For example, Sheriff uses three separate dummy variables in 1973 to cover only four observations with the consequent problem that the implied policy estimates will also include random errors.

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Table 2.3 Estimates of Policy Influence on Wages from the Empirical Literature

% p.a.

	NBPI (1968)	Lipsey and Parkin (1970)	Smith (1968)	Parkin (1972)	Parkin et al. (1976)	Henry et al. (1976)	Sheriff (1977)	Henry and Ormerod (1978)	Sargan (1980)
1961 (1)									
(2)							0.9		
(3)									
(4)			-1.6*		0.5				
1962 (1)	-0.9						0.9		
(2)							0.2		
(3)									
(4)				0.2					
1963 (1)		0.2							
(2)			-0.6*				-1.0*		
(3)									-0.7* (-0.7)
(4)									
1964 (1)									
(2)									
(3)									
(4)									
1965 (1)									
(2)									
(3)	-1.0		-1.0*						
(4)							-1.9		
1966 (1)							-0.5		
(2)	-0.9	0.3				-1.3*	-2.9*		
(3)									
(4)			-1.3*	0.4	-1.1		-2.9*	-0.2	
1967 (1)									
(2)									
(3)									
(4)								0†	-1.2* (0.1)
1968 (1)							-0.8		
(2)								-1.9*	
(3)									
(4)							-1.3*		
1969 (1)									
(2)									
(3)									
(4)									
1970 (1)									
(2)								2.9*†	
(3)									
(4)									
1971 (1)									
(2)									
(3)									
(4)									
1972 (1)									
(2)									
(3)							3.0*		
(4)						0.6	1.9	-1.4	1.6* (1.9)
1973 (1)							-1.1		
(2)								0.9†	
(3)							-0.8	-0.2	
(4)									
1974 (1)									
(2)									
(3)								0.2†	
(4)									
1975 (1)									
(2)									
(3)									
(4)									
1976 (1)									
(2)									
(3)									
(4)									
1977 (1)									
(2)									
(3)									
(4)									

<u>Notes to Table 2.</u>

For general methodology see Table 2.1.

* denotes statistically significant policy effect.

NBPI (1968) uses an annual model; and distinguishes between types of policy. 1961-2 and 1966 are regarded as tight and 1965 as loose.

Smith (1968). Results quoted are for the regular dummy variable and its effects on weekly wage rates.

Sheriff (1977) uses announcement dummies and continuous dummies, see Table 1.1.

Henry and Ormerod (1978): preferred equation from Table 9. Effects are on the <u>rate of acceleration</u> of wage inflation. Estimates marked † are catch-up estimates.

Sargan (1980): details are taken from an earlier version of this paper as they are not given in the final version. Figures in brackets refer to instrumental variable estimates.

that used by Henry *et al*. (1976) and consequently the dependent variable is defined as the rate of acceleration of wage inflation. The policy effects estimated should therefore be interpreted in this way, as should the policy catch-up effects which Henry and Ormerod allow for (but see the discussion earlier in the chapter). In addition to the standard policy and catch-up dummies Henry and Ormerod also include a shift dummy after 1975(2) to prevent the model from breaking down. Even so it should be noted that only three of the thirteen coefficients in their equation are statistically significant at the conventional level (and one of the coefficients is the first-order serial correlation coefficient). Henry and Ormerod are not able to distinguish between alternative hypotheses regarding this additional shift dummy. It is not clear therefore whether it can be attributed entirely to incomes policy. The two significant policy episodes are the period 1967(3)-1969(2) (but not the preceding freeze) and the catch-up variable for this period. Although many of the values of the catch-up effects are similar to those of the relevant policy estimates no conclusion about catch-up effects is possible given the lack of statistical determinacy.

All the studies referred to have treated incomes policy as exogenous. An exception is the study by Sargan (1980). He uses both the policy on/off and the dummy variable approach and in the latter treats the dummy variables as endogenous variables within estimation. Sargan finds that the policy on/off approach leads to marginal significance of policy using the standard Chow test.[18] Using dummy variables he finds significant downward pressure on wages between 1961(1) and 1965(4) and 1966(1) and 1969(4) when using ordinary least squares but this significance disappears when instrumental variables are used (although the point estimate of policy between 1961 and 1965 is unchanged). The period between 1972 and the end of 1973 is never of the expected sign and is significant under ordinary least squares but not under instrumental variables. However, the choice of the period is a little odd since it overlaps a period of implicit policy aimed at the public sector ('n-1') with the wage freeze of late 1972 and early 1973, together with subsequent phases of policy in 1973.

The provisional results of Lawson (1982) who moves towards a quantity measure of policy treats 1965-9 and 1976-7 as the main policy periods using an annual real wage resistance model. [19] Since the periods are combined there is one coefficient to be estimated and this is of the order of 0.2 suggesting that, for 1965 and other years outside the main policy periods above, policy was just sufficient to offset the trend 2 per cent per annum growth of real earnings. The index of policy is equal to unity in these years whilst the effect in 1968/9 is just 1 per cent; in 1976 it is 5 per cent and 5½ per cent in 1977.

2.5 Summary and conclusions

This chapter has outlined the real wage resistance model and its properties. This model forms the basis of the wage equation around which the modelling of incomes policy is discussed. The augmented Phillip's curve is seen to be a special case of the real wage model.

From the taxonomy of effects of incomes policy it is shown that existing approaches have concentrated very much on the dummy shift approach and the inadequacies of this treatment are explored. Empirical estimates of policy effects are presented. Examination of this material shows that there is clearly no consensus regarding the impact of incomes policy on wages since 1961. However, much of the conflict over estimates appears to be related to differences in the choice of policy periods and it is almost impossible to unravel this in order to compare policy estimates more accurately. The conclusion from the empirical literature therefore appears to be, not that there is wide disagreement regarding the impact of incomes policy, but that there is wide disagreement regarding the choice of periods when policy operated. Even if there were greater accord regarding the choice of policy periods the lack of an attempt to distinguish between the relative strength of different policy periods would make any general conclusion about incomes policy at best unhelpful. The assumption that the decision to impose policy is independent of other variables in the system may not only bias estimates of policy but may imply implausible macroeconomic outcomes.

Notes to Chapter 2

1. Though note that the logic of the real wage resistance framework implies that expected inflation is the correct concept since catch-up for past inflation is already incorporated in the real wage mechanism.

2. This procedure provides exactly equivalent coefficient estimates to combining (a) and (b). However, if the error terms in the policy "on" and policy "off" equations do not have the same variance the t-ratios of the coefficients will differ between the two approaches. See Stewart and Wallis, 1981, pp.175-7.

3. For example, Henry and Ormerod (1978) omit certain periods when policy was felt, a priori, to be weak.

4. In the extreme case where each time period during which policy was in operation is allowed a dummy variable the model becomes equivalent to the policy "off" equation (but see note (2)).

5. It is because of the anticipation effect of controls that the U.K. Government has usually attempted to impose the more severe phases of policy without prior warning.

6. In some cases this shifting of settlements may be a deliberate act of policy when policy has either deferred settlements or allowed previously agreed settlements to be implemented at a later stage.

7. A very recent study by Lawson (1982) uses a similar approach to that developed here, namely an attempt to quantify incomes policy by real wage pressure. Policy is still treated as exogenous however. Differences between the Lawson model and the model developed here are discussed in further chapters.

8. A policy which operated simultaneously on wages and prices might of course avoid this initial reduction in real wages but then this is equivalent to operating both a wage and prices policy. This thesis is concerned only with the former.

9. If a_1 is not unity the wage equation has the property that real wage growth depends (negatively) on price inflation (Currie, 1981).

10. The result whether inflation accelerates at a constant rate or at an accelerating rate depends critically on the parameter on the price inflation term in the wage equation (a_1).

11. Most aggregate studies of incomes policy have ignored this expectational element. An exception is Sheriff (1977).

12. As noted earlier, the real wage resistance model already includes compensation for past price inflation.

13. e.g. Carlson and Parkin (1975).

14. Sargan (1980) allows for endogeneity to policy dummies by using the estimation method of instrumental variables.

15. If $\dot{w} = \alpha + \beta I + G + \varepsilon$

is the wage equation where I is the policy variable and G represents other exogenous influences on wages and policy itself is determined by a relationship such as:

$I = \dot{w} + z + \eta$

where z are other exogenous influences on I, the parameter β would be biased in a positive direction.

16. Particularly the Cambridge Economic Policy Group's model which uses a form of the real wage resistance equation.

17. Both studies find a significant statistical difference between the policy "off" and the policy "on" models.

18. However, he argues that the dependence on the asymptotic approximation required by the presence of lagged endogenous variables; the possible presence of simultaneous equation bias and the lack of uniformity of income policy effects make the evidence for a significant effect inadequate.

19. Although Lawson accepts that policy was operative between 1972-4 he ignores the period in his formal analysis although a 'dummy' is incorporated for 1972 to reflect "non-systematic wage-push" factors .

CHAPTER 3 THE GENERAL APPROACH

The previous chapter gave an account of the treatment of incomes policies in the empirical literature. From this account it was clear that some of the controversy over the effects of incomes policies upon wage inflation have resulted from inadequate measurement of the strength of incomes policy. There has also been little attempt to integrate incomes policy into the wage equation other than in an ad-hoc fashion or to formally treat incomes policy as an endogenous variable within the wage-price system. In the first part of this chapter a general approach is outlined which incorporates incomes policy into the wage model and which derives the pure policy-off wage model as a limiting case of this model and where policy reaction is explicitly incorporated. The model outlined requires the presence of a quantitative indicator of policy and this chapter describes how the "pressure" approach can be used to develop such an indicator.

3.1 The model in outline

The basic approach assumes that there are two main sets of forces. The first comes from the Government in attempting to establish a restraining influence on wages. The second, and opposing force, comes from trade unions or workers in general in attempting to resist wage controls and to minimise the effect of controls on wage settlements. This resistance partly stems from the threat to the operation of 'free' collective bargaining but more importantly from the impact of wage controls on real wages. The discussion of Chapters 4 and 5 reveals the extent and variation of trade union opposition to incomes policies in the past. Thus union response can be seen as the extent to which they facilitate or hinder the force of controls emanating from the government.

Figure 3.1

Effective Controls

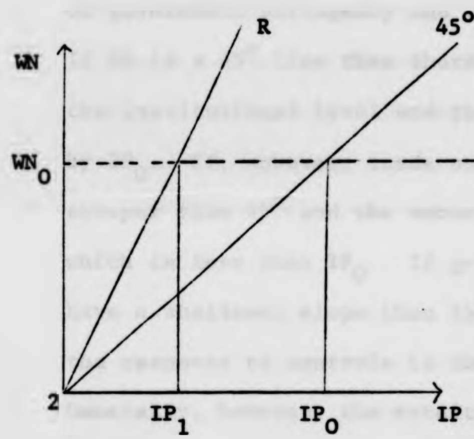
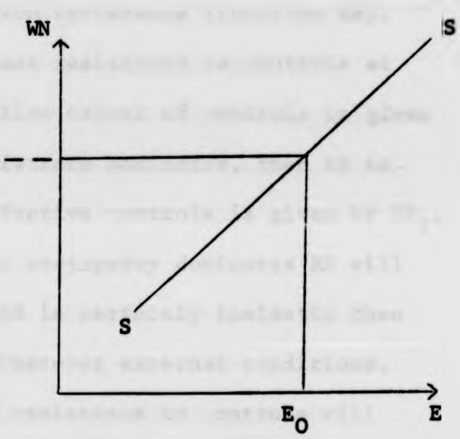


Figure 3.2

The Supply of Nominal Controls



Let us assume first that the decision to impose a certain level of wage controls by policymakers is related to deteriorations in macroeconomic performance. This is shown in Figure 3.2 where the supply curve of wage controls (SS) is related positively to adverse economic developments (E). At point E_O, for example, the extent of controls is WN_O. The slope of SS reveals the sensitivity of policy response to macroeconomic developments, a steeper slope representing a higher marginal response in terms of wage controls when economic circumstances worsen. Figure 3.2 therefore can be classed as the policy reaction and the form of the relationship SS is discussed fully in Chapter 7. WN_O is correctly interpreted as part of the ex-ante measure of controls, measuring as it does the authorities' desired strength of incomes policy. It may, of course be influenced by the current or expected outcome for wage inflation without controls. SS is drawn as a linear relationship for convenience but in fact there are strong reasons for prefering non-linear forms of relationship (see Chapter 7).

Figure 3.1 translates the desired level of controls by the authorities into the effective measure of controls via the net effect of government stringency and trade union resistance (function RR). If RR is a 45° line then there is no net resistance to controls at the institutional level and the effective extent of controls is given by IP_0. If, however, trade union resistance dominates, then RR is steeper than 45° and the amount of effective controls is given by IP_1, which is less than IP_0. If government stringency dominates RR will have a shallower slope than 45°. If RR is perfectly inelastic then the response to controls is the same whatever external conditions. Generally, however, the extent of net resistance to controls will be positively related to the magnitude of the authorities' desired strength of controls so that RR will have a positive slope. Unlike bilateral monopoly models (e.g. Johnston and Timbrell, 1973) it is assumed that government controls and trade union reactions are independent of one another. It must be admitted that this is a very restrictive assumption.

The measure IP is then the appropriate measure for the strength of incomes policy in the wage equation. It does not measure the final (ex-post) effectiveness of controls. The methods used in the empirical literature confuse ex-ante and ex-post effectiveness of policy. Because they are unable to measure the ex-ante effect of policy they are obliged to resort to often arbitary distinctions about the strength of incomes policy. They are therefore unable to correctly assess the effect of any given strength of incomes policy upon wage determinations. By incorporating as much a priori information into the estimation of the relationships SS and RR the appropriate parameter on the incomes policy variable in the wage equation measures the average degree of slippage between institutional controls and the actual outcome.

It is highly probable that many of the variables which determine the shape and positions of the RR and SS relationships are not quantifiable other than ordinally or by binary variables. In addition, some factors may only be measured subjectively. In the case of WN one of the main indicators is the nominal wage norm. This needs to be modified for general exceptions to the norm (such as provision for equal pay) and for exceptions in specific cases (for example, previously agreed settlements).

Factors influencing the net resistance function are likely to be more complex. One important element is the extent to which the norm is backed up by various enforcement mechanisms (for example, the same nominal wage norm was administered more severely during 1968-9 than 1969-70). Measures of the toughness of policy are therefore highly relevant. Toughness may be measured by voluntary/legislative indicators but clearly involves much more than this. In terms of union response, the movement may be more sympathetic to a Labour government than to a Conservative one. Institutional response may also be affected by the extent to which controls limit trade unions' authority in determining wages under collective bargaining. Economic factors may also play their part however. The degree of acquiescence might be related to changes in the level of real earnings; the degree of pressure exerted on existing settlements by controls; and by current and expected developments of the economy, particularly those relating to inflation and unemployment.

The nominal wage norm is one possible component of WN. However, the same value of wage norm will have quite different implications for the pressure on wages if the underlying rate of inflation is say 4 per cent per annum or 14 per cent per annum. Certainly some scaling is required to produce a useful indicator of policy pressure and relating the wage norm to the rate of underlying wage inflation would be one way of achieving this. However, a more attractive proposition would be to determine the measure of incomes policy strength by its potential impact on real wages. From the discussion of incomes policy effects in Chapter 2, it emerged that in a world where prices are determined as a mark-up on costs of production and where this process is subject to lags, then any reduction in wage inflation following the imposition or increasing strength of controls will also reduce real wages in the short run. Thus whilst it may not be the authorities' intention to reduce real wages in the medium term, any slowdown in wage inflation will produce at least a temporary reduction in real wages.[1] The implication of this approach is that if the impact effect of incomes policy on real wages is greater than the continuous effect then the pressure of incomes policy is seen to decline throughout the policy. The traditional approach implicitly treats policy pressure as constant throughout any chosen policy period. Thus the supply of controls by the authorities is given by:

$$WN_t = \dot{wn}_t - \dot{p}_{t-1} \qquad (3.1)$$

where WN_t is the real wage pressure and

where $\dot{wn}_t$ is the nominal wage norm (appropriately adjusted for exceptions) and $\dot{p}_{t-1}$ is the rate of price inflation in the previous period. One possible criticism of this measure of real wage pressure is that it implies equal pressure when trend real wages are growing relatively rapidly and when trend real wages are growing relatively slowly. An alternative measure of real wage pressure might therefore be:

$$WN_t \equiv \dot{wn}_t - \dot{p}_{t-1} - (\overline{r.w/p}) \qquad (3.2)$$

where $(\overline{r.w/_p})$ is a measure of trend real wages. Incorporation of the term in trend real wages raises questions regarding the incomes policy pressure variable and its relationship to the desired real wage growth in the real wage resistance equation. This issue is discussed later in this chapter when the specifications of the incomes policy variable in the wage equation are dealt with.

We can now write down an algebraic outline of the general model in equations (3.3) - (3.8):

$$WN_t = f_1\ (E_{it},) \qquad (3.3)$$

$$WN_t = \dot{wn}_t - \dot{p}_{t-1} \qquad (3.4)$$

$$WN'_t = \dot{wn}_t - \dot{p}_{t-1} - (\overline{r.w/_p}) \qquad (3.5)$$

$$IP_t = (GPS_t - TPS_t).WN_t \qquad (3.6)$$

$$IP_t = f_2(Z_{it}) \qquad (3.7)$$

$$\dot{W} = f_3(X_{it},\ IP_t) \qquad (3.8)$$

Equation (3.3) gives the form of government reaction to external developments (E_{it}), including price developments, and determines exceptions) and $\dot{p}_{t-1}$ is the rate of price inflation in the previous period. One possible criticism of this measure of real wage pressure is that it implies equal pressure when trend real wages are growing relatively rapidly and when trend real wages are growing relatively slowly. An alternative measure of real wage pressure might therefore be:

$$WN_t \equiv \dot{wn}_t - \dot{p}_{t-1} - (\overline{r.w/p}) \qquad (3.2)$$

where $(\overline{r.w/_p})$ is a measure of trend real wages. Incorporation of the term in trend real wages raises questions regarding the incomes policy pressure variable and its relationship to the desired real wage growth in the real wage resistance equation. This issue is discussed later in this chapter when the specifications of the incomes policy variable in the wage equation are dealt with.

We can now write down an algebraic outline of the general model in equations (3.3) - (3.8):

$$WN_t = f_1\ (E_{it},) \qquad (3.3)$$

$$WN_t = \dot{wn}_t - \dot{p}_{t-1} \qquad (3.4)$$

$$WN'_t = \dot{wn}_t - \dot{p}_{t-1} - (\overline{r.w/_p}) \qquad (3.5)$$

$$IP_t = (GPS_t - TPS_t).WN_t \qquad (3.6)$$

$$IP_t = f_2(Z_{it}) \qquad (3.7)$$

$$\dot{W} = f_3(X_{it},\ IP_t) \qquad (3.8)$$

Equation (3.3) gives the form of government reaction to external developments (E_{it}), including price developments, and determines the stance of policy (WN_t) given by the pressure on real wages.

Equation (3.6) translates the authorities' pressure on real wages into effective controls by incorporating government stringency (GPS) and trade union response (TPS). The construction of the measure of GPS is based on historical interpretation and GPS is therefore only measured as an ordinal index. GPS is determined by the form of policy (eg. voluntary/mandatory) and by the enthusiasm with which policy is pursued. Two alternative approaches to modelling TPS are used. In the first TPS is defined by historical study in a similar way to GPS and is therefore only an ordinal index of resistance. The main criteria in deciding upon values for TPS are the form of policy (for example, the union leadership may be less antagonistic towards voluntary policies), the state of union militancy, the degree of pressure on controls and the general economic environment (for example, attitudes may be 'softer' in economic crisis situations). The second option is to proxy the variable TPS by measures such as strikes and then formally explain this proxy by the same set of variables used to determine the unobservable TPS. This alternative does imply, however, a movement away from the institutional concept of TPS.

Finally, we have equation (3.8) which specifies the influence of the effective incomes policy measure (IP) in a model of wages.

Derivation of measures for GPS, TPS amd WN is explained in Chapters 4 and 5. Chapter 4 gives a general analysis of policy over the period and Chapter 5 deals with details of the construction of these variables. Application of equation (3.3) is discussed in Chapter 7 and applied empirically in Chapter 8 whilst the form of equation (3.8) which deals with the specification of IP within the wage equation is described in the remainder of this Chapter and is empirically applied in Chapter 6.

3.2 Specification of incomes policy within the wage equation

Most examples of modelling incomes policy in the empirical literature offer an ad-hoc approach. The model proposed by Reid (1979) however sets out a more general model where the policy"off" model becomes a special case of the general model.

The basis of the Reid model is as follows: the standard 'underlying' wage equation (which he takes as an augmented Phillips curve) is:

$$\dot{w}_t = a_0 + a_1 U_t + a_2 \dot{\bar{p}}_t + \varepsilon_t \qquad (3.9)$$

and the behaviour of wages under controls is:

$$\dot{w}_t^c = (1-k)\dot{w}_t + k\dot{w}_t^* \qquad (3.10)$$

where $\dot{w}_t^c$ is wage growth in periods of control and $\dot{w}_t^*$ is the indicator of the strength of controls. In the model proposed by Reid the parameter k is used to give a measure of the effectiveness of policy so that if k = 1 then the wage equation under control becomes a horizontal line at $\dot{w}_t^c = \dot{w}_t^*$. If controls are completely ineffective, however, k = 0 and equation (3.10) collapses to the policy 'off' equation (3. 9).

It is possible to combine the 'on' and 'off' equations to give a general formulation of wages under controls as:

$$\dot{w}_t^c = a_0(1-k) + a_1(1-k)U_t + a_2(1-k)\dot{p}_t + k\dot{w}_t^* + (1-k)\varepsilon_t \qquad (3.11)$$

This equation now differs from the controls "off" equation (3.9) in that the incomes policy term appears with a coefficient k and the remaining variables have coefficients of (1-k) times their values under period when controls are absent. Reid measures the strength of policy by the wage norm and the distinction between policy "on" and "off" is therefore given by the presence or otherwise of a wage norm. Whilst the Reid model is a step forward in using a quantitative index of policy it still requires a choice to be made between policy "on"and policy "off" periods. For the reasons given in section 3.1 the wage norm alone does not appear to be the best quantitative index of policy strength and the model is unable to distinguish between vigorously and weakly applied policies. One way out of the dilemma is to make (3.11) a general explanation of wage growth by replacing $\dot{w}_t^c$ by $\dot{w}_t$ and incorporating values for $\dot{w}_t^*$ for each period of history. This involves calculating an implicit value for ex-ante policy effectiveness even when no explicit policy existed. In instances of genuine policy "off" periods $\dot{w}_t^*$ could be set by $\dot{w}_{t-1}$ (i.e. without any policy influence or variation in the other determinants of wage growth, wage inflation would be influenced solely by past rates of wage inflation)emphasising the comparability element in wage determination. In fact 'pure' policy "off" periods are rare so that this is not a critical assumption. As the policy influence is measured in real terms (WN) the real wage pressure term will collapse to lagged real wage inflation in the absence of a policy.

If we rewrite (3.11) in the form of the real wage resistance model described in Chapter 2 and also replace $\dot{w}_t^c$ by $\dot{w}_t$ we obtain:

$$\dot{w}_t = a_0(1-k) + a_1(1-k)U_t + a_2(1-k)\dot{p}_t + a_3(1-k)\ ({}^{TW}/p)_{t-1} +$$

$$a_4(1-k)T + k(\dot{w}n_t - \dot{p}_{t-1}) + \eta_t \qquad (3.12)$$

where r refers to the retention ratio and where $a_3 = -\lambda$, the adjustment coefficient on lagged real wages. The parameter $a_4 = \lambda\theta$ where θ reflects the desired long-run growth of real wages. With six coefficients to be estimated and with six structural parameters the equation is just identifiable.

One of the problems in modelling incomes policy is in drawing out implications of the 'effectiveness' of incomes policy in general and of the effects of specific phases of policy. Even if $\dot{w}$ the policy measure is captured by real wage pressure then we would expect the parameter k to vary considerably during the period under consideration. Equation (3.12) should therefore be re-written as:

$$\dot{w}_t = b_0\,(1-k_t) + b_1(1-k_t)U_t + b_2(1-k_t)\dot{p}_t + b_3(1-k_t)(r^w/p)_{t-1}$$

$$+ b_4(1-k_t)T\cdot + k_t\,(\dot{wn}_t - \dot{p}_{t-1}) + (1-k_t)\varepsilon_t \qquad (3.13)$$

Since wage inflation now depends non-linearly on the time profile of k (3.13) cannot be estimated directly treating k_t as unknown. The earlier discussion implies however that factors such as government stringency and trade union reaction are useful proxies for k_t.

We can write $k_t = \gamma IPS_t$ (3.14)

where IPS_t is a linear function of the measure of government stringency (GPS) and the measure of trade union reaction (TPS). The parameter γ can be interprete partly as a scaling factor but it also measures the significance of policy and its <u>average</u> effectiveness. Equation (3.13) can now be written as:

$$\dot{w}_t = b_0(1-\gamma IPS_t) + b_1(1-\gamma IPS_t)U_t + b_2(1-\gamma IPS_t)\dot{p}_t$$

$$+ b_3(1-\gamma IPS_t)(r.^W/p)_{t-1} + b_4(1-\gamma IPS_t)T + \gamma IPS_t(\dot{wn}_t-\dot{p}_{t-1}) \quad (3.15)$$

We now have six unknown parameters: γ, b_0, b_1, b_2, b_3, b_4 and six coefficients to be estimated.

This model is estimated in Chapter 6 alongside the less general formulation where the incomes policy variable $(IPS_t(\dot{wn}_t - \dot{p}_{t-1}))$ is merely included as an additional variable in the wage equation without the corresponding weighting of the other variables.

The restricted version of the wage model assumes that the observed response coefficients of the principal determinants of wage inflation vary systematically according to the strength of incomes policy. It is therefore quite closely related to the general class of variable parameter models. One alternative specification would be a switching regression model (Judge et al., 1982) where distinct regimes apply at different parts of the sample. In the case in point the model could switch between policy "on" and policy "off", close to the spirit of the Reid (1979) formulation. Application of this approach would result in a generalised dummy variable treatment such as described earlier. However, the fact that policy has been so pervasive means that this is not a practical proposition[2]. An alternative version of the variable parameter model which is related more closely to the model outlined earlier is that of the more general systematically varying parameter model.

If we write $y_t = x_t' \beta_t \quad t = 1 ..... T$

as the basic equation with

$$\beta_t = Z_t\gamma + v_t$$

where Z is a k x m matrix ; k is the number of observations and m the number of variables. Z_t 'explains' the variation in β_t; γ is an m x 1 vector of coefficients and v_t is a vector of random disturbances.

$$\text{Now } y_t = x_t' \beta_t = x_t' (Z_t\gamma + v_t) = x_t' Z_t\gamma + x_t' v_t = w_t'\gamma + \epsilon_t$$

$$\text{where } w_t' = x_t' Z_t \text{ and } e_t = x_t' v_t$$

If v_t satisfies the usual least squares assumptions the least squares estimator of γ is best linear unbiased but if it has non-zero contemporaneous covariance between variables it is heteroskedastic.

In Chapter 2 there was a discussion of how incomes policy might affect the structure of the wage equations. This discussion distinguished between the treatment of incomes policy where the values of the parameters varied under policy 'on' and where more general changes in the equation occurred. In particular we might classify the main routes for incomes policy as follows:

(a) changing the value of a_0 (the dummy shift approach)

(b) changing the coefficients on a_1 and a_2 (the dummy slope approach)

(c) through influencing the rate of adjustment of real wages to its target level (λ)

(d) through changing the target level of the desired real wage

(e) by changing the state of price expectations

(f) by eliminating some of the variables in the equation and by introducing new variables

The formulation adopted here incorporates (a) - (d) through the general weighting system (k). The model chosen implies a common effect on all the coefficients but this is a product of the approach which specifies how the policy-on coefficients relate to those in the underlying equation. This is not accomplished by empirical estimates based on using dummy variables to "allow" for the effects of policy. Routes (d) and (e) are also incorporated through the parameter weighting since this is equivalent to a parameter change. The parameter effect is constant for all policies however whereas it is possible that different forms for policy might have different implications for real wage targets and for price expectations, depending, for example, on whether policy was expected to be permanent or temporary. Problems in allowing for these effects however reflect more on inadequacy of their general representation within the wage equation rather than in specifying their sensitivity to incomes policy. For example, desired real wages are usually taken to be a constant time path and price expectations proxied by past price inflation.[3] There is some empirical evidence (e.g. Coutts et al., 1976, and Henry and Ormerod, 1978) that wage determination can be viewed more as a form of compensation behaviour than one based on future expectations. However, incomes policy can still play a role through shifting the pattern of settlements over time.

Finally, route (f) is accommodated via the inclusion of an additional term in the real wage pressure and intensity of policy.

In one of the two alternative formulations of policy trend real wages are used. This raises the issue of the relationship of the policy variable to the general real wage trend embodied in the underlying equation via the time trend. If the latter really reflects some idea of a flexible target (as for example stressed by Coutts et al., 1976) rather than the immutable target as suggested by empirical implementation and if the target can be represented by a moving-average process the same term appears in the underlying equation and as part of the wage controls variable. Writing (3.12) in full with this substitution gives:

$$\dot{w}_t = a_0(1-k) + a_1(1-k)U_t + a_2(1-k)\dot{p}_t + a_3(1-k)({}^{rw}/p)_{t-1}$$
$$+ a_4(1-k)\pi_t + k\left[IPS_t(\dot{wn}_t - \dot{p}_{t-1} - \pi_t)\right] + \eta_t \qquad (3.16)$$

where $\pi_t = \overline{(r.w/p)}$ = trend real wages

Collecting the last two terms and expressing a_4 in structural terms we have:

$$\lambda(1-k)\pi_t + k\left[IPS_t(\dot{wn}_t - \dot{p}_{t-1})\right] - k\left[IPS_t\pi_t\right]$$

If IPS_t is normalised to unity then the terms in π_t become

$$\pi_t\left[\lambda(1-k) - k\right]$$

3.3 Summary

This chapter outlines ways in which information about incomes policies can be translated into an overall index. The main features of such a measure are the wage norm, the degree of government 'toughness' and trade union reaction. The final measure of incomes policy is set in terms of the pressure on real wages since any incomes policy resulting in a slowdown in wage inflation is likely to reduce real wages at least in the short run.

The chapter sets out a general model of wages which includes a role for incomes policy and discusses the problems of drawing out the effectiveness of incomes policy in general against the effects of specific phases of policy. Two possible wage models are set out.

In one all the parameters of the standard real wage resistance equation vary with policy "toughness" whilst real wage pressure enters as a separate variable. In the other the coefficients are fixed but policy "toughness" and real wage pressure enter jointly as a separate variable.

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Notes to Chapter 3

1. Longer run effects will depend on both the parameters of the wage equation and the nature of any exchange rate adjustment, see the discussion in Chapter 2.

2. In addition, there is the problem of dynamic effects, see Chapter 2.

3. The empirical work described in Chapter 6 also uses a moving-average target for real wages.

CHAPTER 4 POLICY ACTIONS AND THE GENERAL MACROECONOMIC BACKGROUND

The first section of this chapter describes the general setting of macroeconomic policy and its economic background over the period in question. This provides a framework for Chapter 8 which deals with the endogeneity of policy. It also puts the varying role of incomes policy into a more general perspective. Decisions related to the strength and imposition of incomes policy are described in the following section of the chapter.

It is not intended to give a blow-by-blow account of policy actions over the period. Detailed descriptions of this sort are provided by Blackaby (ed., 1978) for the period up to 1974 whilst more politically oriented discussions are given in Stewart (1977) and Keegan and Pennant-Rea (1979).

Table 4.1 sets out the main macroeconomic indicators over the period whilst Table 4.2 gives a summary of economic conditions and the general nature of policy response. Figure 4.1 gives a graphical account of some of the main objectives of economic policy over the period.

4.1 Overall view

The 1960s were characterised by the search for new policy instruments as dissatisfaction grew about the UK's economic performance, and in particular the growth record. In retrospect the evidence from the 1960s makes it appear a much more satisfactory period when contrasted with the problems of the economy in the following decade. The unemployment rate averaged under 2 per cent (only a little higher than the 1½ per cent of the 1950s) whilst inflation and growth performance were comparable to the record of the previous decade (inflation averaged 4 per cent per annum and growth was a shade under 3 per cent per annum). The dissatisfaction at the time reflected more the fact that UK economic performance was

Table 4.1 Macroeconomic Indicators 1959-79

	Unemployment - thousands	Inflation % p.a.	Growth % p.a.	Balance of Payments (£m)
1959	468	1.1	3.4	172
1960	368	3.3	4.6	-228
1961	339	4.2	3.6	47
1962	454	2.0	0.9	155
1963	539	3.2	4.1	125
1964	394	2.5	5.4	-358
1965	338	4.8	2.7	-30
1966	353	3.9	2.1	130
1967	547	2.4	2.6	-269
1968	574	4.8	4.5	-244
1969	566	5.4	1.7	505
1970	602	6.3	2.0	823
1971	776	9.4	2.5	1,124
1972	855	7.3	1.3	247
1973	611	9.1	7.7	-981
1974	600	16.0	-0.8	-3,273
1975	929	24.2	-0.5	-1,521
1976	1,274	16.5	3.7	-881
1977	1,378	15.9	1.3	-41
1978	1,376	8.3	2.6	939
1979	1,307	13.4	1.1	-863

Notes:

Unemployment: wholly unemployed, excluding school-leavers.
Inflation: Index of retail prices
Growth: GDP, expenditure measure
Balance of payments: current account.

Source:

Economic Trends Annual Supplement

relatively weak and that many other Western economies could demonstrate superior performance. Criticism of 'stop-go' demand-management policy where expansion was regularly halted by balance of payments crises was given strength by the evidence of the study by Dow (1964). He argued however, that although a steadier demand policy would have smoothed over some of the fluctuations in output and the balance of payments, the balance of payments constituted a major obstacle to sustained economic growth.

Dissatisfaction centred on the application of policy as the main cause of poor growth, despite Dow's conclusions that a steadier demand management policy would not have resulted in an appreciably superior performance on average. Policy-makers in the early 1960s seemed to be arriving at the conclusion that fiscal policy could not produce satisfactory growth without an unmanageable balance of payments position or without unacceptable inflationary results. The work of Phillips (1958) and Paish (1962) leant support towards the idea of a trade-off between inflation and unemployment (eventually to be christened the Phillips curve) and Paish concluded that a rate of unemployment of 2½ per cent was required for price stability. One of the problems of policy therefore was to shift the Phillips curve in order to make this trade-off more appealing to sustained rapid economic growth and this obviously required new instruments. By improving UK international competitiveness at all levels of output such a shift would help the balance of payments and aid the possibility of export-led growth policy supported by Beckerman (1966) and Kaldor (1966). The role of monetary policy was limited in the early 1960s by the influence of the Radcliffe Committee (H.M. Treasury, 1959) and by the need to maintain a fixed parity for sterling so that the main instruments of monetary policy used alongside interest rates were hire purchase controls, special deposits and bank lending requests.

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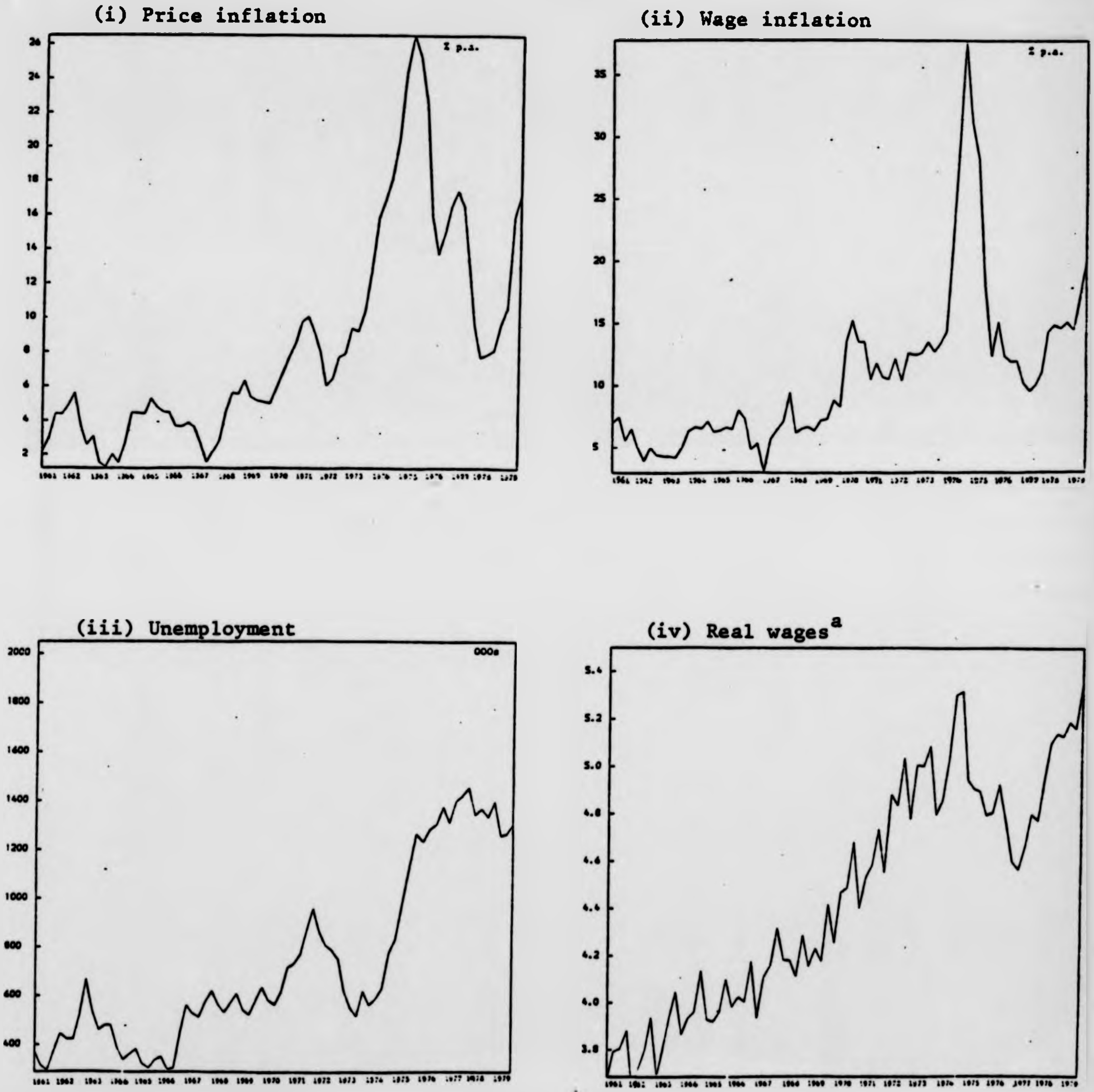
Figure 4.1 Price and Wage Inflation, Unemployment and Real Wages



Note: (a) Defined as wages times retention ratio divided by price level. For definition of variables see Appendix B. Unemployment and real wages are seasonally unadjusted.

Table 4.2 General Economic Climate

Year	Political Party in power	DOMESTIC ECONOMIC CONDITIONS: Unemployment	Inflation	Growth	Balance of payments: Current a/c	Capital a/c	EXTERNAL ECONOMIC CONDITIONS	POLICY STANCE: Fiscal	Monetary	INSTRUMENTS USED [a]
1960	Conservative re-elected late 1959	Falling	Accelerating	Rapid	Substantial deficit	Considerable inflow		Mildly restrictive		SD,BR,PE
1961	Conservative	Beginning to rise	Accelerating	Easing but still fast	Improving	Capital outflow		Neutral at first, some restriction later		SD,BR,HP,PE, IT,IP,BL
1962	Conservative	Rising to over ½ m	Easing	Slow	Further improvement	Little net change		Neutral	Easing	SD,BR,BL, PE
1963	Conservative	Falling	Further easing	Picking up rapidly	Little change	Some outflow	High world commodity prices	Expansionary	Little change	BR,DT
1964	Conservative/Labour from October	Small fall	Accelerating	V.rapid in first half	Widening deficit	Adverse movement at end of year	Output recovery, falling prices	Some deflation in Budget, more restriction later	Some tightening	BR,IT,IMP
1965	Labour	Steady	Steady but high	Slowing	Deficit narrowing	Large outflow	Slowdown of demand	Restrictive	Restrictive	BR,SD,BL, HP,DT,PE
1966	Labour re-elected from March	Rising strongly	Small fall	Steady	Deficit 1st half, reversed later	V.large outflow	Rapid world demand	Very restrictive	Restrictive	BR,HP,SD, IT,IP,PE
1967	Labour	Further rise	Falling	Initially strong	Increasing deficit	Substantial run on capital	Low demand, falling prices	Neutral	Easing at first, tightened later	BR,HP,BL, DEV,PE
1968	Labour	Steady	Accelerating strongly	V.rapid later on	Deficit narrowing	Further substantial drain on capital	Recovery in demand	Very restrictive	Tight	BR,HP,BL, IMP,PE,II
1969	Labour	Steady	Easing	Slow and steady	Large surplus	Some improvement	Demand peaking rapid inflation	Further tightening	Further tightening	BR,HP,BL, IT,DT
1970	Labour/Conservative from June	Rising	Rising	Slow	V.large surplus	Significant inflow	Slowdown in growth	Some easing	Some easing	BR,BL,SD, DT
1971	Conservative	Rising fast	Rising to over 10%	Picking up	Even larger surplus	Substantial inflow	Slow growth	Expansionary	Substantial easing	BR,BL,SD, HP,DT,PE
1972	Conservative	Falling	Easing	Slow	Surplus greatly diminished	Large outflow	Growth accelerating, v.rapid inflation	Very expansionary	Easing at first, tightening later	BR,BL,SD, HP,DT,IP
1973	Conservative	Falling rapidly	Rising strongly	Extremely rapid	V.large deficit	Small net gain	World boom, OPEC I	Neutral at first, restrictive later	Easing to substantial tightening	BR,SD,DT, PE
1974	Conservative/Labour from February	Starting to rise	V.rapid acceleration	Decline	Even greater deficit	V.substantial inflow	Major slowdown in growth	Neutral	Still quite tight	BR,SD,BL, HP,IT,DT
1975	Labour	Rising strongly to over 1 m	Inflation over 20%	Further decline	Some reduction in deficit	Large inflow	Deep recession, falling prices	Little change	Some easing	BR,DT,IP
1976	Labour	Further rise	Easing but still high	Strong recovery	Further reduction in deficit	Extremely large outflow	Recovery in demand and prices	Tightening at end of year	Some easing at first, reversed later	BR,IT,DT, PE
1977	Labour	Continuing to rise	Further easing	Slow	Deficit almost removed	Even larger inflow	Recovery ending, rapid inflation	Further tightening	Some easing	BR,DT,PE, BL
1978	Labour	Stable	Fall to below 10%	Quite strong	Substantial surplus	V.large outflow	Some acceleration in growth	Still restrictive	Easing further	BR,SD
1979	Labour/Conservative from May	Falling	Accelerating	Slowing	Large deficit	Large inflow	Slowing growth, rapid inflation (OPEC II)	Further restriction	Some restriction	BR,DT,IT, BL

Notes:

(a) Abbreviations are as follows:

SD : Special Deposits

BR : Bank rate

PE : Public Expenditure

HP : Hire purchase

IT : Indirect taxes

IP : Incomes Policy (commencement of series of phases)

BL : Bank lending constraint

DT : Direct taxation

DEV : Devaluation

IMP : Import restrictions

The search for new policy instruments led to the introduction of several institutional and planning devices. In 1961 the National Incomes Commission was set up to help with the inflation problem. 1964 saw the formation of a new government department, the DAE, which was charged with promoting economic growth. The DAE produced the 'National Plan' designed to accelerate the growth rate of the economy. Early in 1965 the Labour Government set up the National Board for Prices and Incomes (NBPI) as a successor to the National Incomes Commission (NIC).

In 1962-63 the Conservative government made a dash for growth, which was halted by a large balance of payments deficit in 1964. Towards the end of 1964 the Labour Government was elected and inherited not only this large deficit but also accelerating inflation with the rate of inflation some 4½ per cent per annum by the last quarter of 1964. The Labour government intended to operate a long-term plan using the National Plan and a voluntary incomes policy (the Statement of Intent signed by the Government, TUC and CBI) to accelerate growth without the attendant balance of payments crises and inflation problems whilst refusing to lower the exchange rate. As an additional instrument the Government imposed an import surcharge of 15 per cent on manufactured goods in October 1964.

Although the current account of the balance of payments showed some improvement in 1965 and 1966 capital movements continued to be very adverse and the Government was forced to adopt short-term restrictive measures on demand to prevent the problem of the balance of payments escalating. Meanwhile, inflation remained high and output growth was slowing. In 1966 following the seamen's strike, the government was forced to bring in a very restrictive Budget and to introduce a six-month standstill on wages with statutory backing. This was followed by further periods of severe restraint but with some allowance for pay increases. Although inflation did slow down in 1967 to around 2 per cent per annum unemployment was rising strongly and passed the ½ million mark early in the year. Capital movements continued to be extremely adverse however, and at the end of 1967 the Government was eventually forced to devalue the pound. This effectively brought to an end the National Plan and thus the main role of the DAE and the period after 1967 was devoted to an attempt to ensure that devaluation worked. Policy was accordingly very restrictive as both fiscal and monetary instruments were operated in tandem and in 1968 the import deposit scheme was introduced in order to ameliorate some of the adverse J-curve effect of devaluation on the balance of payments (whereby the balance of payments initially deteriorates following a devaluation as trade volumes respond with a lag to the change in trade prices). Any unemployment target the Government might have had was therefore abandoned and the level of unemployment remained well above 550 thousand between 1967 and 1969 (and was destined never to fall back to this level again).

The balance of payments improvement after devaluation proved to be a long time in coming and the current account did not move into surplus until the beginning of 1969. In addition, speculative pressures in sterling continued so that there was a substantial capital outflow in 1968. However, when the improvement in the current account did occur it was quite dramatic and in 1969 as a whole the current account surplus was £505 million, compared with the deficit of £244 million in 1968.

Some easing of incomes policy stance occurred after devaluation with increases of up to 3½ per cent per annum allowed. However, this placed great strain on the policy as the effects of devaluation fed through to prices and although the inflation rate had fallen to under 2½ per cent for 1967 as a whole, it accelerated to around 5 per cent in 1968 and in 1969. In 1969 the Government's commitment to the incomes policy faltered as it strove to gain support for its industrial relations legislation('In Place of Strife') and in the Budget of 1969 the Government announced that it would not be seeking to renew its powers over prices and incomes when they expired at the end of the year.

The improvement in the balance of payments continued into 1970 although the rate of inflation and the level of unemployment were rising together by then. Mid-1970 saw the election of a new Conservative Government pledged to operate through market forces and determined to limit the scale of any intervention. The revival of the now discredited Phillips curve by Milton Friedman (1968) which now became known as the 'augmented Phillips curve' provided a means by which the Conservative Government hoped to curb inflationary tendencies. It was accepted that this would require some abandonment of a low unemployment target, at least in the short term.

The NBPI was abolished by the new Government but the search to improve economic performance by institutional reforms continued with the introduction of changes to the banking and financial sectors through the new competition and credit control arrangements. This showed new interest in the money stock as such and followed the domestic credit expansion (DCE) target set in 1968 leading to the move away from traditional devices such as hire purchase controls (abolished in 1971) and restraints on bank lending. A more thorough review of the changes in monetary policy implied by the new arrangements and their effects is given by Tew and by Artis in Blackaby (ed., 1978).

The Phillips curve approach towards limiting inflation proved to have little success in 1970 and 1971 however, and the rate of price inflation continued to accelerate whilst unemployment levels rose. This led to measures specifically designed to combat inflation and the CBI agreed to operate a form of price restraint whilst the nationalised industries held their prices down with the help of subsidy finance from the Government. The Government also started to operate directly on wages by applying the 'n-1' policy to the public sector whereby each public sector pay award was intended to be 1 per cent lower than the preceding one. Whilst the rate of inflation did show signs of abating in early 1972, the level of wholly unemployed had exceeded 900 thousand (and the crude unadjusted level of unemployment 1 million) and the Government changed its priorities away from inflation towards reducing unemployment. The dash for growth began in 1972 against a background of a balance of payments surplus and in June 1972 the exchange rate was floated. The decision to float the exchange rate was largely influenced by the breakdown of the Bretton Woods international system but it was also seen as an attractive development by the authorities since it was hoped that it would prevent continued expansion from being prematurely halted by a balance of payments problem (with the implication that a lower exchange rate would be beneficial for output and employment). The dollar exchange rate did in fact fall by nearly 10 per cent between the second and last quarters of 1972 and the current account surplus was rapidly transformed into deficit. This also reflected the very expansionary Budget of spring 1972 where the Chancellor openly stated his intention of ensuring a growth rate of 5 per cent (or more) between the second half of 1971 and the first half of 1973. This growth rate was actually achieved and the level of unemployment was reduced to under 600 thousand. However following a failure to achieve an agreement on a voluntary incomes policy in the summer of 1972 the Heath government announced a 90-day standstill on wages and prices to begin in November 1972 (later to be extended by a further 60 days). This was followed by two further stages of the policy which allowed for some increases in wages. In the final stage of the policy (Stage 3) an allowance was made to index wages to the cost-of-living index after a certain point (the 'threshold' arrangement).

New institutions to monitor pay policy were also set up, the Pay Board and the Prices Commission. Unfortunately Stage 3 coincided with both a falling exchange rate and an explosion in world commodity prices so that the rate of inflation accelerated to over 10 per cent per annum by the end of 1973. Late 1973 also saw a curtailment of OPEC oil supplies and a dramatic increase in the price of oil. This brought growth in the world economy to an abrupt halt as the non-OPEC world sought to ease the inflation effects of the oil price rise and to deal with the resultant enormous balance of payments deficit. The Government was forced to bring in a restrictive Budget in late 1973 but then a conflict with the miners in early 1974 over their pay award led to the introduction of a 3-day working week and eventually to a general election, at which the Government was defeated and the Labour Party returned to power.

The new Government allowed the threshold provisions of the Stage 3 pay policy to continue to operate but otherwise abandoned the operation of the policy. They also eventually removed the Pay Board replacing it with a voluntary arrangement with the TUC (the 'Social Contract'). The basis of this Social Contract was compensation for increases in the cost-of-living but it was not clear whether this was intended to apply to <u>past</u> increases or <u>expected future</u> increases. Usually the most favourable interpretation was adopted. Fiscal policy was restrictive and the world economy was in deep recession with the result that unemployment rose sharply in the first half of 1975. The rate of inflation was at an unprecedented high level (24 per cent in the second quarter) and the current account deficit in the first half of 1975 was nearly £800m (the deficit for the whole of 1974 was over £3 billion). However, there was a substantial inflow of capital so that the fall in the exchange rate was only modest. The level of output was falling and 1974 and 1975 were the first years to record an overall decline in GDP in the post-war period. The Government then introduced a voluntary but more rigidly defined incomes policy in August 1975 and this was followed by further annual phases of policy in 1976 and 1977. In an attempt to stimulate growth the exchange rate was 'talked down' in 1976 but the consequent slide in sterling was much greater than the authorities had intended and they were forced to obtain assistance from the IMF in order to support the pound. The conditions of this loan were fiscal and monetary restraint and this led to the introduction of monetary targets. The Government itself, whilst prepared to aim at these targets, principally by slowing down the rise in public expenditure, did not appear to accept the monetarist view of the economy that they implied. Indeed, Dennis Healey, the Chancellor, appeared to have adopted a cost-push view of wage inflation and to have accepted the real-wage resistance hypothesis as the basis for policy since he attempted to trade off wage inflation for reductions in taxation. However 1976 did see the year of anti-reflationary doctrine and this is best illustrated by a quote from James Callaghan, the Prime Minister, who stated:

> 'We used to think that you could spend your way out of a recession, and increase employment by cutting taxes and boosting Government spending. I tell you in all candour that this option no longer exists, and that insofar as it ever did exist, it only worked by injecting a bigger dose of inflation into the economy, followed by a higher level of unemployment as the next step.'

J. Callaghan, Labour Party Conference, 28 September 1976.

With the end of the threshold effects on wages and the impact of the new incomes policy the rate of inflation did slow down after 1975 and was down into single figures in 1978. However, this was at the cost of a steady rise in the level of unemployment to around 1½ million.

The election of the Conservative Government under Mrs. Thatcher in May 1979 saw a radical shift in approach yet again. Policy making was to place more emphasis on monetary considerations for sterling M3 the centre-piece of economic strategy. The declared intention of the Government was to restrain inflation and the level of unemployment became again a secondary issue. The stress on the market approach to the economy left no role for incomes policy and emphasis was to be placed on stimulating the supply-side of the economy by reducing direct taxation. An even more radical change in view was that relating to exchange rate policy. A <u>rising</u> exchange rate was now seen as virtuous for its effects on inflation(and the exchange rate rose by 7 per cent in 1979) whereas the prevailing view in the early 1970s had been that a <u>falling</u> exchange rate was the most attractive option because of its benefit to output and employment. This change of view was very much related to the interpretation of the empirical evidence to suggest that there was no long-run trade-off between unemployment and inflation. The new Government was also attracted by the rational expectations revolution, and such was this attachment to monetarist thinking that they were prepared to increase the rate of VAT and to allow the Clegg Commission awards on public pay to be fulfilled. In the event inflation accelerated again, partly due to the VAT influence and partly due to a further strong rise in world commodity prices, especially oil.

4.2 Conduct of policy and the use of policy instruments

Throughout the 1960s and the early 1970s fiscal policy was used extensively to alternatively expand or restrict the level of economic activity. Monetary policy became more ascendent in the middle to late 1970s when the main policy instruments used were the PSBR and interest rates. Earlier the main weapons of monetary policy had been interest rates (mainly short rates) and measures such as special deposits, restraints on bank lending and hire purchase controls. The change in emphasis towards monetary targets in the mid-1970s diminished the role for these measures and relegated fiscal policy to be subservient to monetary policy instead of being relevant in its own right. Although the changes in the operation of the monetary system, introduced in 1971 (Competition and Credit Control), were intended to remove controls and to emphasise competition and market forces policy since 1971 was far from non-discriminatory and advances requests and hire purchase controls were re-introduced. In addition, a new control, supplementary special deposits (known as the 'corset') were introduced and not abandoned until 1980.

It is extremely difficult to choose an appropriate indicator of the tightness or otherwise of monetary policy (the so-called indicator problem, see Artis, 1978) and the assessment of policy made in Table 4.2 is a fairly subjective interpretation based on the movements in the main instruments of monetary policy.

Estimating the strength of fiscal policy is in some ways more straightforward but there are still problems. For example, the size of the public sector borrowing requirement reflects the cyclical position of the economy as well as policy measures and for this reason the full-employment, or cyclically-adjusted, financial surplus/deficit is often used. This measure has been occasionally produced by the National Institute of Economic and Social Research and is described in Price (1978). However, it does depend critically on the assumptions made regarding the "full employment" level of unemployment, the growth of productive potential and the elasticities of tax receipts with respect to income. In fact the estimates available do have a break in them around 1973 when the full employment level of unemployment was revised upwards, and the rate of growth of productive potential revised down (see Table 4.3). However, the

Table 4.3 Monetary and Fiscal Policy 1960-79

	Fiscal Policy Weighted full-employment budget surplus - % of GDP		Monetary Policy Hire purchase index	 special deposits	Bank rate no. of changes	 maximum change	Bank lending
1960	-7.33		23.3	1,1	up x 2 down x 2	1	-
1961	-6.75		22.2	1	up x 1 down x 2	2	1.0
1962	-6.11		22.2	-1,-1,-1	down x 3	½	1.25
1963	-7.87		22.2		down x 1	½	-
1964	-8.00		22.2		up x 2	2	-
1965	-6.53		25.7	1	down x 1	1	1.0
1966	-6.67		35.2	1	up x 1	1	1.75
1967	-7.02		35.8		down x 3 up x 3	1½	1.25
1968	-4.27		36.9		down x 2	1	1.5
1969	-1.58		42.5		up x 1	1	2.0
1970	-2.52		42.5	½,1	down x 2	½	1.25
1971	-3.61		21.25	-3½	down x 2	1	0.5
1972	-5.23		-	1,2	down x 1 up x 3	1	-
1973	-6.30	-9.3*	-	1,1	down x 7 up x 3	4	0.25
1974		-10.4*	36.1	-½,-1,-½	down x 6	½	1.0
1975		-9.0*	36.1		down x 10 up x 3	1	0.25
1976		-7.7*	36.1		down x 6 up x 3	2	-
1977		-5.8*	36.1		down x 19	1	1.0
1978		-5.8*	36.1	-1½,-½,-1,1,1	down x 1 up x 5	2½	1.0
1979		-5.1*	36.1	-2,-1,2,-1½, 1,½	down x 2 up x 3	3	-

Notes: Weighted full employment budget surplus:

Source: Blackaby (1978) and NIER (Feb.1980)

Figures to 1973 assume full employment is at 1960 level and that productive potential grows at 3.2% p.a.

Figures marked * assume full employment is at 1973 level and that productive potential grows at 2½% p.a.

All estimates are for financial years.

Hire purchase index : h = d + (100-d)/m where d = deposit rate and m = repayment period in months. Both measures are for cars.

Special deposits: rate of call

Bank rate: number of changes with direction and maximum sign of change

Banklending: Index of restriction, zero = none, 1 = mild, 2 = severe, taken from Blackaby (1978)p.262.

pattern of change, apart from at such break points, is still useful. An additional refinement to this measure of fiscal stance is the weighted full-employment financial surplus where items are given weights reflecting their demand content so that changes in public current expenditure on goods and services, for example, have a greater effect than capital transfers. (See Artis, 1972 and Price, 1978.) This is the measure adopted in Table 4.3.

Fiscal changes over the period were not concentrated in the annual Budgets and the experience of the 1960s and early 1970s was one of frequent and large discretionary changes with substantial policy actions taken between Budgets and although fiscal policy became less active in the late 1970s the trend towards more frequent adjustments to taxes and public expenditure plans was continued (see Table 4.2). The main fiscal instruments used were income tax rates and allowances, indirect tax rates, and changes in public expenditure. Changes in company taxation and in investment incentives were also used but customarily without any great expectations as to their impact. To assess the impact of changes in tax allowances it is necessary to make some adjustment for fiscal drag (i.e. the tendency of the real value of the allowance to change with inflation). Adjusted figures are shown in Table 4.4. Similar considerations apply to specific duties such as those on drink, tobacco and petrol and probably the most comprehensive measure of the overall indirect tax burden is the overall indirect tax rate (less subsidies) as a percentage of GDP. This is also shown in Table 4.4 alongside estimates of personal taxation which allow for discretionary changes. It is much more difficult to distinguish the impact of changes in policy towards public expenditure. In the first place changes in policy usually refer to changes in future pattern of change, apart from at such break points, is still useful. An additional refinement to this measure of fiscal stance is the weighted full-employment financial surplus where items are given weights reflecting their demand content so that changes in public current expenditure on goods and services, for example, have a greater effect than capital transfers. (See Artis, 1972 and Price, 1978.) This is the measure adopted in Table 4.3.

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Table 4.4 Fiscal Measures 1960-79

FINANCIAL YEAR	MARRIED PERSON'S ALLOWANCE NOMINAL(£)	REAL[a] (£75)	% p.a.	BASIC RATE OF TAX %	PURCHASE TAX/VAT %	DISCRETIONARY CHANGE ON PERSONAL TAX[c] £m	CALENDAR YEAR	INDIRECT TAX RATE[d] TAXES LESS SUBSIDIES % GDP	PUBLIC AUTHORITIES' CURRENT EXPENDITURE[d] % p.a.
1959/1960	240	665	-	30.14	5.50	-295			
1960/1961	240	655	-1.5	30.14	5.50	-	1960	12.7	1.9
1961/1962	240	629	-3.9	30.14	5½ - 55[b]	51	1961	12.5	3.6
1962/1963	240	606	-3.6	30.14	{10 - 45, 10 - 25[b]	55	1962	12.9	3.1
1963/1964	320	796	31.4	30.14	10 - 25	-334	1963	12.8	1.6
1964/1965	320	767	-3.2	30.14	10 - 25	121	1964	13.4	1.6
1965/1966	340	774	0.9	32.08	10 - 25	208	1965	14.0	2.7
1966/1967	340	746	-3.6	32.08	11 - 27½[b]	354	1966	14.7	2.7
1967/1968	340	727	-2.5	32.08	11 - 27½[b]	54	1967	14.9	5.7
1968/1969	340	695	-4.5	32.08	{12½ - 50, 13¾ - 55[b]	740	1968	15.7	0.4
1969/1970	375	725	4.3	32.08	13¾ - 55	335	1969	17.5	-1.9
1970/1971	465	853	17.7	32.08	13¾ - 55	-198	1970	17.3	1.5
1971/1972	465	784	-8.1	30.14	11¼ - 45[c]	-1,004	1971	15.9	3.0
1972/1973	600	961	22.6	30.14	11¼ - 25	-1,459	1972	14.7	4.1
1973/1974	775	1,144	19.0	30.00	VAT 10.0	-380	1973	13.5	4.7
1974/1975	865	1,095	-4.3	33.00	10.0	n.a.	1974	11.3	1.5
1975/1976	955	972	-11.2	35.00	8.0	n.a.	1975	11.0	5.8
1976/1977	1,085	958	-1.4	35.00	8.0	n.a.	1976	11.7	0.8
1977/1978	1,215	920	-4.0	34.00	8.0	n.a.	1977	13.4	-1.1
1978/1979	1,535	1,069	16.2	33.00	8.0	n.a.	1978	13.5	2.1
1979/1980	1,815	1,150	7.6	30.00	15.0	n.a.	1979	15.5	1.7

Notes: (a) At average 1975 prices

(b) Changes at other than in annual Budget

(c) Announced changes in income and expenditure taxes on the personal sector allowing for the effects of fiscal drag
Source: Blackaby (1978) p.174.

(d) Source: Economic Trends Annual Supplement plans, and in the second place there is often a wide divergence between intentions and the actual outcome (see Price, 1978). Actual out-turns for public current expenditure are given in Table 4.4 and from this it is evident that, whether intended or not, public current expenditure was expansionary in 1961 and 1962, 1967, 1971-73, and 1975 and contractionary in 1963-64, 1968-70, and 1976-77.

Major policy instruments other than fiscal, monetary and incomes policy used over the period include import restrictions (the import surcharge of 1964, the deposit scheme of 1968), and devaluation in 1967. The selective employment scheme (SET) was introduced in 1966 and abolished in 1971.

Specific institutional changes, other than those associated with prices and income policy were the formation of the DAE in 1964, the change to new methods of monetary control (Competition and Credit Control) in 1971, the floating of the exchange rate in 1972 and joining the EEC in 1977. Other changes of note were the introduction of the unified income tax system in 1973 and the change from purchase tax to value-added tax also in 1973.

The conclusion regarding policy in Blackaby (ed. 1978) is that for long periods economic policy followed the principle of one thing at a time and one idea at a time and that policy decisions were often reactions to circumstances with particular issues dominant at certain times. Keegan and Pennant-Rea (1979) emphasise a cycle of influence in economic policy beginning with the election of a new government. In the early stages they see political influences as most powerful as political parties attempt to apply their manifesto aims. Gradually, however, the official party machine gains more influence but a final stage is often the influence of financial markets and outside bodies (eg. IMF) as various crises emerge. Wass (1978) in turn concentrated on the growing uncertainty over the period and especially the uncertainty with regard to policy trade-offs.

Whilst some of these conclusions do appear to fit the history of macro-economic policy in the last twenty years they do not rule out the possibility that policy-making has been systematic and in Chapter 8 ways of reconciling these conclusions with a quantitative explanation of policy are given.

4.3 Description of incomes policy 1961-79

The Pay Pause

1961 saw the introduction of the 'pay pause' by the Conservative Government (July 25). It introduced a basic framework which lasted until 1970 and was then re-established in 1973. This framework consisted on a wage 'norm'; a set of criteria on which to judge claims and deviations from the norm; and an independent body to review the claims. No new institutions were set up in fact at this time, instead the Government relied on the existing Council on Prices, Productivity and Incomes (which was a 3-man body) to review changes in prices, productivity and incomes. They had no powers and did not report on specific cases, having a mainly educational role. The Government proposed a zero norm for pay with no exceptions. There were no powers to enforce the powers and the proposal met with trade union opposition. The main emphasis of policy in practice was through the Government itself in its role as public sector employer. Existing commitments were honoured in the public sector but new claims were delayed 'until circumstances permitted'.

A civil service pay increase was delayed for seven months but by May 1961 printing workers had achieved a settlement of 5½ per cent plus a

40-hour week showing that the private sector was not following the example of the public sector and in June teachers were granted a 15 per cent increase to become effective in January 1962. In November the Electricity Council broke the guidelines of the pay pause.

Guiding Light

In February 1962 a new White Paper (Cmnd.1626) - 'Incomes Policy: The Next Step' - changed the policy from 'pay pause' to 'guiding light' with a consequent change in norm from zero to 2-2½ per cent per annum. Now exceptional increases in productivity were allowed to result in increases above the norm. Low pay, labour shortage and the restoration of differentials were additional reasons why pay settlements might be allowed to exceed the norm. The pay pause itself ended in March. After the teachers' award and up to the end of the pause other settlements in the public sector were moderate but outside the zero norm. Railway workers, the miners and lower-paid university workers were all granted increases of around 3 per cent as were the electricians in April and local authority workers and busmen in May. Thus the early stages of the guiding light saw no noticeable change in the pace of pay settlements in the public sector. The private sector continued to experience higher settlements and bank workers, for example, received an award of between 5 and 8 per cent in April.

Pressure was put on several wage councils in April 1962 to reconsider their awards but they refused to lower them. The increase in wage settlements gained some pace in June when non-industrial civil servants were awarded a 4 per cent increase, this was followed by a comparable settlement to Post Office workers. After August the pace accelerated again in the public sector with 7½ per cent given to nurses in September (backdated to April) and 6 per cent to railway workers, Post Office engineering workers and the police in November. This brought the public sector closer into line with the increases being granted in the private sector where tanker drivers, for example, had received 5½ per cent in September.

In November 1962 the National Incomes Commission was established. This had no substantive powers and it was opposed by the TUC and received no co-operation from any trade union. Its terms of reference were to review pay where the cost was met from the Exchequer or to examine retrospectively private or public sector settlements referred to it by the Government. It took one reference under the first criteria and three under the second. In all it produced five reports on the four references. The norm for settlements remained at 2-2½ per cent with the exceptions identical to those outlined in Cmnd.1626. In February it was announced that the norm of 2-2½ per cent for pay would last for at least one year and in April a new norm of 3-3½ per cent was set for the period after October 1963. The NIC considered the national agreements in 1963 of engineering and shipbuilding workers (who received an increase of up to 10 per cent); Scottish builders; heating, ventilating and domestic engineers. It condemned these cases but acquitted the Scottish plumbers' agreement. It also recommended salary increases well above the norm (10 per cent) for university academic staff - an award described by Clegg (1971) as the most generous that they have (sic) ever received. There were no further major innovations in incomes policy in 1963 although the TUC General Council reports did note the "need for policies to ensure that money incomes, wages, salaries, profits as a whole rose substantially less rapidly than in the past". It also passed a motion in council, however, which declared complete opposition to any form of wage restraint. The magnitude of settlements in 1963 was of the order of 4 - 5 per cent, well above the norm with 5 per cent becoming the going rate towards the end of the year. There were marked divergencies between the pace of private and public sector wage increases.

Moves towards a permanent voluntary policy - the Declaration of Intent

Pay settlements accelerated a little further in the first half of 1964 and average earnings were growing by some 6½ per cent per annum. In June a Court of Inquiry recommended increases for electricity supply manual workers of between 5-12½ per cent. Following this busmen and post office workers were granted rises well above the guiding light. The TUC had moved a little towards acceptance of incomes policy in general but not with any attempted imposition of policy which had as an aim, restraint of wages and salary increases. In October the Labour Party came to power already committed to an incomes policy. In December they issued a 'Declaration of Intent' which indicated their aims and which had support from the CBI and TUC . Among these aims were the need to keep under review the general movement of prices and of money incomes and to examine particular cases in order to define whether or not the behaviour of prices or wages, salaries or other money incomes was in the national interest as defined by the Government in consultation with management and unions.

In Table 5.5 we can see that the increase in wages over the 'guiding light' period was between 4 and 6 per cent per annum depending on the precise measure adopted. There is some indication of wage drift with earnings rising more rapidly than basic rates. In February 1965 the Government proposed the establishment of a National Board for Prices and Incomes (Cmnd.2577 -'Machinery of Prices and Incomes Policy')and this became operational in April 1965 and it received its first three references in May. A White Paper in April (Cmnd.2639 -'Prices and Incomes Policy')set out the basic policy. There was to be a norm of 3-3½ per cent (as under the guiding light). Three main exceptions to this norm were allowable productivity, redistribution of manpower and low pay. These exceptions were to remain until the disbandment of the Board in 1970. The provision of the productivity exception was to promote incentives for improved efficiency with the aim of increasing the rate of economic growth. The definition adopted was that exceptional productivity was'where the employees concerned, for example, by accepting more exacting work or a major change in working practices, make a direct contribution towards increasing productivity in a particular firm or industry. Even in such cases some of the benefit should accrue to the community as a whole in the form of lower prices'. In practice the productivity exemption was used increasingly over the period to 1970 and was often used by the Board to prevent over-reliance on the other two criteria. The second criterion was labour shortage 'where it is essential in the national interest to secure a change in the distribution of manpower (or to prevent a change that would otherwise take place and a pay increase would be both necessary and effective for this purpose.' This was not used much by the NBPI since it raised too many problems of comparability . There was also a danger with the low pay criterion ('where the pay of certain groups of workers has fallen seriously out of line with the level for similar work') especially as there was no clear definition of what constituted low pay. The TUC however who endorsed the establishment of the NBPI attempted to use the policy much more effectively to the benefit of the low paid and in 1967 the TUC general committee introduced its own criteria for low pay which included a clear definition of a move to a minimum rate of £15 per week.

The background to policy was an assumption of stable prices if the norm was adhered to. Therefore there were no additional measures on prices, only that prices were not to be raised unless productivity could not be increased sufficiently to prevent an increase in prices or unavoidable increases in non-labour or capital costs. The NBPI itself had no powers and had merely an advisory role on the cases referred to it, relating to the prices charged for goods; claims, settlements, questions relating to pay or other conditions of service or employment and questions relating to other money incomes. It became clear very soon that many wage and price increases were not according to the criteria and so in October 1965 the Government arranged for a voluntary "early-warning" system for reporting significant increases to the Board. The Board could now impose delays until after it had reported, usually between 2 - 3 months. This was finalised in November (Cmnd.2808) - 'Prices and Incomes Policy - An Early Warning System'). The TUC and CBI co-operated voluntarily in the early-warning system and the TUC agreed to vet claims itself. The Government had earlier announced that it would seek statutory powers to enforce the proposals although in the end it took no powers.

At the same time the National Plan was announced and the incomes policy was seen as an integrated part of this plan. The clear intention was that incomes policy would remain as a permanent device and that it would be voluntary.

<u>The move to a statutory policy - the 1966 freeze</u>

Wage pressure was mounting however with earnings increasing by 6½ per cent in the second half of 1965 and by 7½ per cent in the first half of 1966 and with speculative pressures on sterling accumulating the Government ended the voluntary phase of incomes policy in July with the introduction of the Prices and Incomes Act (Cmnd.3073 - 'Prices and Incomes Standstill') which gave the Government the power to delay pay or price increases.

Under the statutory powers of the 1966 Prices and Incomes Act the Government had the power to delay wage increases by 1 month and if the settlement were referred to the NBPI the increase could not be implemented until after the report was published. The policy allowed for genuine promotion and increments and allowed existing commitments to be honoured after a delay of six months. Otherwise no new agreements were permitted before January 1967 so that the policy was in effect a freeze from July to December 1966. The compulsory standstill was backed by Part IV of the Act. The Government was forced to activate statutory powers at the end of September by ASSET but only seven standstill orders were made up to January 1967 covering only 36,000 workers. The general council of the TUC reluctantly acquiesced in the policy and the annual Congress accepted the freeze by a majority of 4.9 to 3.8 million. The freeze did not reduce wage inflation to zero but it did produce a substantial slow-down.

Pay Policy after the 1966 Freeze

The six-month freeze was followed by a period of severe restraint for the following six months. This was enacted in Cmnd.3150 -'Prices and Incomes Standstill: Period of Severe Restraint'. The severe restraint applied to increases in pay and reductions in hours but not to other conditions of service except where these were likely to add significantly to labour costs. This period of severe restraint still had a zero norm but now increases deferred during the freeze could be implemented. Several substantial increases were made during this period notably to civil servants (backdated to July 1965), firemen and probation officers.

The role of the NBPI had now changed. The Government powers were now conditional on an adverse NBPI report although they were not obliged to act on it. However, not all proposed settlements were referred to the NBPI. In particular the Devlin agreement in 1967 which allowed a modernisation payment of 5p an hour to dock workers was allowed through by the Government with no reference to the NBPI. After the London and Liverpool dock strike this payment was increased to 10p an hour. The NBPI could also only deal with about 30 references a year so that it was not possible for it to conduct a comprehensive review of wage settlements. Under the phase of severe restraint between January and July 1967 a zero norm was maintained but the original criteria under the pre-standstill policy were resumed. Controls were essentially voluntary and consisted of powers to delay settlements. There was a 30 day standstill whilst the Government examined claims. They could then order a further delay of up to 3 months if the claim was referred to the NBPI. At the end of the 3 months the Government could impose a further delay of 3 months if suggested by the NBPI, giving a total potential delay of seven months. The policy stipulated a 12 month interval between settlements but it was intended to allow Part IV of the Prices and Incomes Act to lapse in August 1967.

The TUC resumed its vetting system in this phase of policy but it was hostile to the NBPI guidelines on productivity and recommended a 7 per cent wage norm for its own vetting purposes. The TUC was becoming more dissatisfied with policy however and the annual Congress passed a set of critical motions calling for repeal of the 1966 Prices and Incomes Act. In the following phase between July 1967 and March 1968 the zero norm was retained but the powers of delay were increased to a maximum of seven months. This was announced in a White Paper in March 1967 (Cmnd 3235 'Prices and Incomes Policy after 30 June 1967') which argued that there was no justification for returning to a norm of

3-3½ per cent. The White Paper stated that increases foregone under the standstill should not be made good although commitments deferred until July 1967 could be implemented. The controversial statutory powers of Part IV of the Prices and Incomes Act were allowed to lapse in August 1967 leaving the backing for the policy as largely voluntary as the remaining controls were essentially those of delaying settlements. In this phase of policy an increasing number of settlements had a productivity clause as part of the claim.

The fourth phase of policy began in April 1968. A 3½ per cent maximum increase had been announced in January and the White Paper published in April (Cmnd.3590 'Productivity, Prices and Incomes Policy in 1968 and 1969') announced an increase in potential delay to twelve months by giving the Government the power to delay settlements for a period of eight months after the NBPI had reported. Increases above the 3½ per cent ceiling were to be justified in three exceptional circumstances: for major productivity agreements; major wage or salary restructuring or for low-paid workers as part of a settlement which, as a whole, was within the ceiling. The NBPI (Report 36) had set guidelines for productivity agreements. These were that:

(1) workers should make direct contributions to pay by accepting more exacting work or a major change in working practices.

(2) forecasts of increased productivity should be derived by the application of proper work-standards.

(3) costs per unit of output should be reduced.

(4) there should be effective controls to ensure that productivity gains were achieved.

(5) there should be clear benefits to consumers via stable prices.

Through 1968 the Government was becoming less concerned about wage settlements and more concerned about legislation to moderate industrial action and allowed through a pay settlement of 8-9 per cent for railwaymen and averted a general engineering strike in October 1968 by allowing a three-stage settlement well above the ceiling without any reference to the NBPI. In its Fifth and Final General Report the NBPI (Report 170 p.1) stated that:

> 'by the beginning of 1969 ....it had become apparent that the Government was tending to accept wage increases of up to 3½ per cent almost automatically. In many cases when wage increases were referred to the Board, the Government had already agreed to an immediate increase of 3½ per cent and instructed the Board to examine the justification for a larger increase, for example for bus maintenance workers in September 1968, clearing bank employees in November 1968 and workers in the exhibition contracting industries in March 1969. In other words the 3½ per cent figure was thus rapidly becoming a floor rather than a ceiling.'

TUC reaction was gradually becoming more hostile. This was partly reflected by the behaviour of the TUC incomes policy vetting committee. Between November 1966 and November 1967 340 claims were notified to the TUC committee (covering 4 million workers) and approval was withheld in 40 per cent of the cases. [1] After May 1967 the Committee met less frequently and of 461 claims considered up to January 1968 only 126 were passed but most unions ignored the TUC view. In the second half of 1968 however, the TUC found 309 out of 327 claims unobjectionable and only sent 18 claims to its panel which usually passed them. It never really accepted the 3½ per cent ceiling and instead adopted its own criteria of 6 per cent (Panitch, 1976). At the TUC Congress in September there was a vote of 7.7 million to 1 million in favour of repeal of the Prices and Incomes Act.

In April 1969 the Government announced that it would reactivate Part II of the Prices and Incomes Act, including the wage delaying powers and the statutory Prices and Incomes Board. As the work of the TUC vetting committee became more relaxed so the number of references to the NBPI declined. In the second half of 1969 there were only six new references, of which four related to incomes, and only one reference was held back until the Board reported so that the powers of delay were used much less vigorously than in the early stages of the policy.

The emphasis towards industrial relations legislation and away from incomes policy matters was reflected in the White Paper of December 1969 (Cmnd.4237 'Productivity, Prices and Incomes Policy after 1969') which proposed a new ceiling of between 2½-4½ per cent for 1970. Equal pay was now added as an exception. The White Paper was rejected by the TUC.

<u>The election of the Conservative Government and a new approach</u>

In February the TUC abandoned its incomes policy vetting committee. In June, the pay policy was effectively ended with the election of the Conservative government committed to a less interventionary role. In November the winding up of the NBPI was announced and 1970 as a whole saw a great burst in the number and size of wage settlements.

By the end of 1970 the faith in unemployment as the restraining mechanism on wage growth was being gradually eroded and the Government started to exert pressure on the public sector with its 'n-1' policy which was based on the principle that each successive public sector wage agreement should be 1 per cent less than the preceding one. The underlying rationale behind the policy appeared to be that the strong comparability element in wage determination could be broken in this way so that the size of private sector wage settlements might also be reduced eventually. There was certainly little sign of a major deceleration in public sector settlements during the winter of 1970. The dustmen received 14 per cent and the miners accepted 12 per cent and the electricity workers were awarded between 14 and 18 per cent after a work-to-rule. The one part of the public sector to be taken on were the Post Office workers who after a lengthy dispute only managed to increase their original 8 per cent offer by a further 1 per cent. To prop up this policy the Government managed to persuade the CBI to operate a period of price restraint from July 1971 and agreed in turn to hold back price increases by the nationalised industries. Problems with the pay policy continued however and in November the miners began an overtime ban and this became a full strike in January before the Wilberforce Inquiry in February granted them an increase of between 17 and 20 per cent. This marked the effective end of the n-1 policy and this was officially recognised by the Government in March. Pay policy was then left somewhat in a limbo in succeeding months as the Government attempted to achieve an agreement on a voluntary pay policy with the CBI and the TUC. Anti-inflationary measures were not helped by the CBI's refusal to extend its support for price restraint in July 1972.

The 1972 Standstill.

In August the Government proposed a £2 p.w. pay limit but the tripartite talks broke down and in November statutory powers were taken (Counter-Inflation Act) to freeze pay and prices for 90 days (with a possible extension for a further 60 days). The White Paper accompanying the legislation (Cmnd.5125 'A Programme for Controlling Inflation: The First Stage') stated that promotions and increments were to be allowed and that where the operative date of a settlement was before November 6 1972 it could be implemented, otherwise it would be deferred until the end of the standstill. There was in fact a small flurry of settlements before the freeze and electricity supply manual workers, local authority manual workers and government industrial workers all had settlements operative in the first week of November.

Policy after the standstill

A White Paper published in January 1973 (Cmnd.5205 'The Programme for Controlling Inflation: The Second Stage') announced the procedure following the period of standstill. The original standstill was extended for another 60 days until the end of March 1973. Deferred settlements were to be allowed 90 days after their original operative date or on the 1st April as long as there was at least a 12 month interval between settlements. The basic norm for stage 2 of the policy to run from April 1973 to October 1973 was £1 p.w. + 4%. Increases agreed before the freeze were allowed and women's rates of pay could be increased so as to reduce the differential between male and female rates by one-third by the end of 1973. Legislation was also enacted (Cmnd.5206) to establish a new set of institutions, the Pay Board and the Price Commission. The TUC were not opposed to an agreement on pay in principle but they wanted higher increases than envisaged by the Government. They also wanted statutory control of prices whereas the price component of the policy merely ensured that increases in pay above the norm could not be passed through to prices. The TUC denounced pay restraint throughout the policy and refused to sit union representatives on the Pay Board and Price Commission.

Principles of the new pay policy and the work of the Pay Board.

Unlike the NBPI who were obliged to only review settlements referred to them by the Government the Pay Board reviewed all pay settlements affecting 1000 or more employees before they could be implemented. They could reject settlements not conforming to the pay code but the Government had the power to over-rule the Pay Board.

Unlike pay policy in the 1960s it was now clearly stated that the aim of policy was to progressively reduce the rate of inflation rather than to attempt to achieve price stability. Pay was now monitored by the size of the pay bill rather than by individual earnings and this treatment has been referred to as 'kitty bargaining'. The average increase allowable under Stage II of the policy was 4% plus £1 p.w. and settlements were limited to a minimum of 12 months. The maximum individual increase allowed was £250 p.a. and changes in overtime were to count against the limit.

Exceptions to the limit were equal pay; hours of work (if they were over 40 hours per week); holidays; increments; and promotion.

Stage II of the policy lasted only from April to October 1973 and the proposals for Stage III were announced in October 1973 (Cmnd. 5446 'The Counter Inflation Policy. Stage 3. A Statement by the Prime Minister'). The new norm was to be 7% or £2.25 p.w. whichever was to be the greater[2]. To this norm was added a flexibility margin of 1% (to cover improvements in efficiency which had to be observed by the Pay Board before payment would be made) as well as the exceptions such as improvements to holiday pay, the move to equal pay and the reduction of hours of work. An allowance for the miners as a special case was also implicitly written into the policy through a clause relating to unsocial hours (see Holmes, 1982). A radical addition to the terms of a pay policy was the attempt to partially index-link pay by announcing a cost of living safeguard. If the retail price index were to rise more that 7 per cent above its base level in October 1973 each additional 1 per cent would be compensated by an additional 40p. a week. In the final analysis this proposal was to prove devastating to attempts to reduce inflation since it coincided with the world-wide boom in commodity prices and the four-fold increase in OPEC oil prices so that the threshold was breached as early as April 1974 and triggered in all no less than eleven times before October 1974.

Confusion over the miners' pay award led to an overtime ban in November and a strike in February which resulted in a 3-day working week for the majority of industry and commerce. This occurred despite the specific inclusion of a clause to treat the miners as a special case. In the end a general election was called in February and the Labour Government managed to form a government. The new government immediately granted the miners a substantial rise and made no attempt to apply the Conservative government's policy other than to allow the threshold provisions to continue to operate. They abolished the Pay Board in July.

The Social Contract

The TUC was prepared to operate a system of voluntary wage restraint with the new Labour government and published its guidelines for this so-called 'Social Contract' in December 1974. The basic principle for pay under the Social Contract was compensation for price increases but this was not specific as to whether past or anticipated price increases were the critical factor and indeed many claims seemed to include both! The going rate for wage settlements was 25-30 per cent by the first quarter of 1975 and in July the Government announced a more specific (but still essentially voluntary) policy which had a £6 p.w. limit (with a cut-off point for pay increases set at £8,500) to run from August 1975 to July 1976. This policy had the overt support of the TUC, who indeed helped to plan it, and the pay policy was approved by the TUC Congress in September. The £6 pay limit was to apply directly to the public sector with government influence used indirectly over the private sector through public sector purchases and there were powers held in reserve - notably legislation to make it illegal for the employer to exceed the pay limit (Cmnd.6151 'The Attack on Inflation'). The Price Code was maintained and the whole of any price increase could be disallowed for pay increases in breach of the policy. In the annual budget in 1976 the Chancellor of the Exchequer promised tax cuts conditional on an agreement being made with the TUC on a pay norm of around 3 per cent for the following phase of policy. In the end the TUC and Government agreed on a norm of between 4½ and 6 per cent and in June the White Paper (Cmnd.6507 'The Attack on Inflation - The Second Year') announced a limit of £2.50 p.w. for those earning below £50 a week, 5% for those earning between £50 and £80 p.w. and a maximum increase of £4 p.w. At the same time some easing was announced in the Price Code provisions, estimated to add about 1 per cent to the retail price index. Phase 2 was formally endorsed by the TUC in July and was planned to run from August 1976 to July 1977.

In March of 1977 the Chancellor again announced tax cuts conditional on negotiations of a new pay policy. Some of these cuts were later rescinded in July as although the TUC continued to support the policy in general they were being more reluctant to agree to a specific limiting figure.

Phase 3 of the Labour Government's pay policy began in August 1977 and ran to July 1978. It was formally announced in a White Paper (Cmnd.6882 'The Attack on Inflation after 31st July 1977') and proposed a maximum increase of 10 per cent. In September the TUC voted in favour of unions' commitment not to re-open incomes policy settlements before they have run 12 months but were generally becoming less enchanted with the policy. However, they still supported the Government officially with the General Council voting against supporting the firemen's strike at the end of the year. There were several other industrial disputes during the winter of 1977/8 although the pay policy continued to hold.

In July 1978 the Government announced the proposals for Phase 4 (Cmnd.7253 'Winning the Battle against Inflation'). The new norm was to be drastically reduced from the 10 per cent of Phase 3 to 5 per cent. Productivity deals were to be self financing but there could be 'kitty bargaining' within 5 per cent to correct anomalies. Increases in low pay above 5 per cent were also allowed (with a maximum on earnings of £44-50 p.w.). Some allowance was also made for special cases.

The TUC was becoming more hostile towards the pay policy. (Mayhew, 1981). In November the Government invoked a 'special case' in order to allow a 22 per cent deal for firemen but then announced a decision to blacklist Ford for breaking the norm (with a 17 per cent deal). Soon after Vauxhall Motors also agreed a 17 per cent pay increase. In December the Government was forced by Parliament to reject discriminatory action against private companies which breached the pay guidelines. In January a series of crippling strikes in the public sector led the Government to relax policy considerably with acceptance of comparability studies. Union hostility was still growing however, and the GMWU started a co-ordinated campaign against Government pay policy. The policy finally ended in May with the general election and the return of the Conservative Party to power.

1979 and a new direction

The new Conservative Government saw no role at all for incomes policy and instead emphasised the role of market pressures. However, it did allow the Clegg Commission awards to be passed through. Control over public sector pay was through cash limits although no guidelines were set as to the mix of real expenditure and inflation.

4.4 Summary

Analysis of the economic history of the period from 1961 reveals the constant search for new policy instruments in order to achieve the main goals of policy; low inflation, low unemployment and a reasonable rate of economic growth without incurring a balance of payments deficit. Thus incomes policy was continually used in an attempt to improve the inflation-unemployment trade-off. However, the support by the authorities for incomes policy has varied considerably with more than a little faith being placed at times on the underlying properties of the system to solve the problem (eg. the belief in the Phillips curve in 1970; the use of the real wage resistance model in early 1975). The range of form of incomes policy has also been considerable. Some governments have initially attempted to introduce a voluntary long-term policy (e.g. the Labour administration of 1964; the Conservative Government in 1971-2) only to have to resort to a short-term freeze. Whilst such snap measures avoided the bringing forward of settlements which might be induced by pre-announced measures they have inevitably led to problems in later periods as questions of 'fairness' and 'comparability' have risen.

Whilst the degree of statutory backing has been very variable there appears to be no regular political pattern relating to the type and degree of incomes policy. Both types of administration have resorted to very similar policies even if their ideological backgrounds would lead one to assume a different attitude towards policy.

More detailed discussion of the precise formulation of incomes policy follows in Chapter 5.

Notes to Chapter 4

1. The committee could take several possible courses of action. It could make no observation. It could point out the criteria to the union concerned. It could make a specific comment on a claim and request the unions to reconsider or it could ask the union to meet the committee.

2. Absolute increases were written into Stages II and III in an attempt to help the lower paid and to appease the unions.

CHAPTER 5 MEASUREMENT OF POLICY

5.1 General considerations

The basic principles underlying the treatment of incomes policy were given in Chapter 3, The incomes policy measures depends on three main elements; real wage pressure, trade union response and the authorities' toughness. Real wage pressure is defined as the wage norm (appropriately adjusted for exceptions) less the rate of inflation in the previous period. Measurement of the wage norm is reasonably straightforward when magnitudes are clearly stated but there do exist several periods when no explicit norm is declared.[1] These periods encompass periods of implicit norms such as the 'n-1' episode and the Social Contract and periods when policy was essentially "off" (for example, the middle of 1970).

The real wage pressure term is defined as:

$$IP_1 = wn - \dot{P}_{t-1}$$

For most of the period it is possible to construct either an explicit or implicit wage norm and there are only a very few complete quarters where no such norm existed (in 1960 and early 1961 , in mid-1970 and mid-1972). For these periods the wage norm is set by the rate of wage inflation in the previous quarter. This is obviously a very subjective rule but it does appear to correspond quite closely with actual bargaining practice where the"going"rate is often emphasised. Given the relatively few number of observations affected in this way it does not seem to be a critical assumption. [2]

The problem that some periods of policy with identical norms have very different institutional arrangements or were applied with different degrees of rigour is dealt with by the government and trade union pressure/reaction variables.

In some periods the stated norm is often a 'maximum' rather

Table 5.1 Incomes Policies 1961-1979

POLICY	POLICY PERIOD	PARTY IN POWER	WAGE NORM	EXCEPTIONS	METHOD OF IMPLEMENTATION	INSTITUTIONAL ARRANGEMENTS	POWERS OF INSTITUTION	TUC RESPONSE
Three Wise Men	1957 -1961 July	Conservative	none	n.a.	none	Council on Prices, Productivity and Incomes	none	Opposition
Pay Pause	1961 July - 1962 March	Conservative	zero	none	voluntary but Govt. powers in public sector	None	-	Opposition
Guiding Light (1)	1962 April - 1963 Sept.	Conservative	2-2½%	(a) exceptional productivity (b) labour mobility (c) low pay (d) differential adjustments	Voluntary	National Incomes Commission	no powers merely reported on cases referred to it	opposition
Guiding Light (2)	1963 Oct. - 1964 Nov.	Conservative	3-3½%	as above	as above	as above	as above	as above
Declaration of intent	1964 Dec. - 1965 March	Labour	no formal norm	n.a.	voluntary	NIC	-	Support
Early warning	1965 April - 1966 July	Labour	3-3½%	as for 'guiding light'	voluntary	National Board for Prices and Incomes	advisory role. From Sept,1965 delay until NBPI reported	agreed to vet claims
Standstill	1966 July - 1967 Jan.	Labour	zero	(a) genuine promotion (b) existing committment delayed by six months	compulsory	NBPI	police standstill	reluctant support
Severe restraint	1967 Jan. - 1967 June	Labour	zero	as for 'early warning'	Part IV of Act allowed to lapse but powers of delay retained	NBPI	powers of delay extended to max. of seven months	vetting begins again but more critical
Restraint	1967 July - 1968 March	Labour	zero	"	basically voluntary but powers of delay	NBPI	seven months delay	TUC set own norm, more hostile
Moderate restraint	1968 April - 1969 Dec.	Labour	3½%	"	"	NBPI	power of delay for up to twelve months	TUC vetting less rigorous, critical
Little restraint	1970 Jan. - 1970 June	Labour	2½-4½%	" plus equal pay	"	NBPI	delaying powers back to four months	vetting ends, openly hostile
No restraint	1970 July - 1970 Dec.	Conservative	none	n.a.	n.a.	none	n.a.	hostile
N-1 policy	1970 Dec. - 1972 March	Conservative	each public sector settlement 1% below norm	private sector	pressure on the public sector	none	n.a.	opposition
Search for voluntary policy	1972 April - 1972 Oct.	Conservative	no explicit norm	n.a.	n.a.	none	n.a.	TUC reluctant to agree on a figure
Stage 1	1972 Nov. - 1973 March	Conservative	zero	none	compulsory	none	n.a.	reluctant acquiescence
Stage 2	1973 April - 1973 Oct.	Conservative	£1 + 4%	(a) equal pay (b) deferred settlements	compulsory	Pay Board and Price Commission	vet all pay settlements, only settlements within norm qualify as cost increases under Price Code	"
Stage 3	1973 Nov. - 1974 Feb.	Conservative	7%	(a) flexibility margin (b) equal pay (c) unsocial hours (d) pay restructuring (e) thresholds	compulsory	"	"	"
Social Contract	1974 March - 1975 July	Labour	compensation for price increases	Equal pay	TUC vetting	none	none	support
Phase 1	1975 Aug. - 1976 July	Labour	£6 p.w.	Equal pay	voluntary but reserve powers	Price Commission	wage increases in excess of norm not allowable for price increases	support for norm
Phase 2	1976 Aug. - 1977 July	Labour	5%	"	"	"	"	"
Phase 3	1977 Aug. - 1978 July	Labour	10%	(a) equal pay (b) self-financing productivity	"	"	"	only general support
Phase 4	1978 Aug. - 1979 May	Labour	5%	(a) self-financing productivity (b) kitty bargaining (c) anomalies (d) low pay	voluntary, some discriminatory sanctions abandoned in December	"	"	hostile
Clegg	1979 June -	Conservative	none	anomalies in the public sector	none	none	n.a.	hostile

than an average or minimum (e.g. the 3½ per cent value in 1968). However as the experience of the NBPI and the Pay Board shows these maxima have in practice been indistinguishable from other forms of norm and all guidelines are applied in the same way. Stated exceptions to the central norm have been included in the wage norm when they are relatively precise. Thus, for example, the productivity provision in the 1968-70 era of policy does not count since it was a vague and open-ended exception, whereas the flexibility margin of the 1973-4 policy had a definite upper limit and is incorporated. Other exceptions to the norm excluded because they are not quantifiable in ex-ante terms are the allowances for labour mobility and low pay in the period between 1965 and 1970. Although equal pay was covered between 1972 and 1974 when there was a clear statement of the allowable increase no allowance is made in the policy measure as the actual take up was exceptionally low. Neither is equal pay included again in the period after 1975 when the provision was non-specific.

The general nature of incomes policies over the period and the various exceptions to the norm are shown in Table 5.1

The wage norm is always expressed as an annual rate since this is the form in which most wage norms have operated. Many of the incomes policies have not distinguished between actual earnings and wage settlements when setting the wage norm. In any case although some settlement data are available (see Appendix D) they exclusively refer to manual workers who represent only just over one-half of total UK employment during the period considered. Therefore the general model is expressed necessarily in terms of earnings although attempts are made to adjust for the settlements-earnings lag between very different periods of policy (a prime example is the allowance of previously agreed settlements to operate with a lag of six months after the 1972 standstill).

5.2 Derivation of the wage norm and exceptions

In this section we outline a description of how a wage norm is calculated for each quarter of the period under consideration. More detailed descriptions of particular effects (such as the qualifications of the 1972-4 policy which involved a mixture of a percentage and flat-rate norm) are given in Appendix C.

An explicit norm for wage increases existed from the inception of the pay pause (July 1961) through to the election of the Conservative Government in mid-1970 and the subsequent abolition of the National Board for Prices and Incomes. A formal figure was also declared for the period from November 1972 (Stage 1 of the Conservative government's policy) until the election of the Labour administration in February 1974 and then again from August 1975 until May 1979 in the various phases of the Labour Government's policy.

No explicit figure for wage increases was therefore declared in 1960 and the first half of 1961, mid-1970 until end-1972, early 1974 until the summer of 1975 and in the second half of 1979. The period between 1970 and 1972 was characterised by an informal policy for most of its duration ('n-1' policy) for which a wage norm can be inferred, and the same applies to the period of the 'social contract' between 1974 and 1975. Thus in very few instances are there genuine policy-off periods (see Table 5.2). These occur in 1970, 1972 and 1979.

The 'Pay Pause', 1961-62, and 'Guiding Light' 1962-64

The pay pause started in the third quarter of 1961 and continued until the first quarter of 1962. It was followed by the 'Guiding Light' policy which lasted until the election of the Labour Government in the last quarter of 1964. Under the pay pause there was a zero norm and no exceptions. The first stage of the Guiding Light policy set a norm

Table 5.2 The Central Wage Norm and Exceptions 1961-79

per cent per annum

		Central wage norm	Exceptions	Adjusted norm	TYPE OF NORM Explicit norm	Implicit norm	No policy			Central wage norm	Exceptions	Adjusted norm	TYPE OF NORM Explicit norm	Implicit norm	No policy
1961	1	5.4		5.4		✓		1971	1	13.4		13.4		✓	
	2	7.1		7.1		✓			2	13.1		13.1		✓	
	3	-		-	✓				3	10.6		10.6		✓	
	4	-		-	✓				4	10.5		10.5		✓	
1962	1	-		-	✓			1972	1	10.1		10.1		✓	
	2	2.5		2.5			✓		2	10.5		10.5			✓
	3	2.5		2.5	✓				3	8.6		8.6		✓	
	4	2.5		2.5	✓				4	2.7		2.7	✓	✓	
1963	1	2.5		2.5	✓			1973	1	-		-	✓		
	2	2.5		2.5	✓				2	6.9	0.2*	7.1	✓		
	3	2.5		2.5	✓				3	6.9	0.1*	7.0	✓		
	4	3.5		3.5	✓				4	7.6	0.8**	8.4	✓		
1964	1	3.5		3.5	✓			1974	1	7.9	1.3**	9.2	✓		
	2	3.5		3.5	✓				2	7.9	2.6†	10.5	✓		
	3	3.5		3.5	✓				3	14.4		14.4			✓
	4	3.5		3.5	✓				4	16.9		16.9		✓	✓
1965	1	3.5		3.5	✓			1975	1	18.1		18.1		✓	
	2	3.5		3.5	✓				2	20.3		20.3		✓	
	3	3.5		3.5	✓				3	17.3		17.3	✓	✓	
	4	3.5		3.5	✓				4	13.8		13.8	✓		
1966	1	3.5		3.5	✓			1976	1	13.8		13.8	✓		
	2	3.5		3.5	✓				2	13.8		13.8	✓		
	3	1.2		1.2	✓				3	8.3		8.3	✓		
	4	-		-	✓				4	5.6		5.6	✓		
1967	1	-	1.25*	1.25	✓			1977	1	5.6		5.6	✓		
	2	-		-	✓				2	5.6		5.6	✓		
	3	-		-	✓				3	8.5		8.5	✓		
	4	-		-	✓				4	10.0		10.0	✓		
1968	1	-		-	✓			1978	1	10.0		10.0	✓		
	2	3.5		3.5	✓				2	10.0		10.0	✓		
	3	3.5		3.5	✓				3	6.7		6.7	✓		
	4	3.5		3.5	✓				4	5.0		5.0	✓		
1969	1	3.5		3.5	✓			1979	1	5.0		5.0	✓		
	2	3.5		3.5	✓				2	8.6		8.6	✓		✓
	3	3.5		3.5	✓				3	14.4		14.4			✓
	4	3.5		3.5	✓				4	17.8		17.8			✓
1970	1	4.5		4.5	✓										
	2	4.5		4.5	✓										
	3	13.6		13.6			✓								
	4	15.1		15.1		✓	✓								

* Pre-standstill settlements ** Flexibility margin plus pre-standstill settlements † Flexibility margin plus threshold

of 2-2½ per cent which was superseded by a new norm of 3-3½ per cent per annum for wage increases in the final quarter of 1963. This second stage of policy continued until the last quarter of 1964. There were several exceptions to the central norm under 'Guiding Light'. These were to reflect exceptional productivity increases; low pay; labour shortage; and the restoration of differentials. However, none of these exceptions were ever quantified ex-ante and are not therefore included in the wage norm. The central norm is set at the upper end of the range in both stages of the Guiding Light policy.

Early warning, 1964-66

The Guiding Light policy disappeared with the election of the Labour government in October 1964 but the new government quickly moved to try to establish a voluntary policy. In November they issued a draft statement of intent on prices and incomes policy with the TUC and in December a final statement was agreed. Although no norm was stated at this time the establishment of the NBPI in early 1965 with a wage norm of 3-3½ per cent suggests that the guiding light norm was never really abandoned. Although the machinery of policy changed further between 1965 and the summer of 1966 with the introduction of legislation enabling delay in November 1965 the 'Early Warning System') the control norm remained the same throughout. The exceptions to the norm also remained as those of the pre-1964 machinery and yet again were not made in specific terms and so are once more excluded.

Statutory freeze and period of restraint, 1966-70

In July 1966 a six-month freeze on wages and prices was imposed, followed by various degrees of wage restraint. Under the period of standstill (July 1966 to January 1967) the central norm was zero but increases in pay due to genuine promotion were allowed and existing commitments were honoured but delayed by six months. An estimate of the latter is included in the norm and is described in Appendix C . In the period of 'severe restraint' which followed the standstill and which lasted until June 1967 the zero norm was maintained but the exceptions allowed under the pre-freeze policy were again included although yet again no ex-ante estimate of the allowable increase due to these factors was given. Similar considerations apply to the succeeding phase of policy between July 1967 and March 1968.

From 1968 a maximum entitlement of 3½ per cent per annum was announced with the same exceptions as previously and this was superseded by a new ceiling of 2½-4½ per cent from the first quarter of 1970. The maximum entitlement is taken as the central norm throughout.

<u>No intervention and the n-1 policy, 1970-72</u>

The Conservative government elected in June 1970 adopted a 'hands-off' policy towards wages initially before embarking on the policy of pressure on public sector wage settlements in November 1970 ('n-1' policy). Pure policy-off in the third quarter of 1970 is incorporated by setting the wage norm as the annual rate of wage inflation in the previous quarter whilst the value of the norm in the fourth quarter of 1970 is given by a weighting of the no-policy value of the norm (calculated in the same way as for the third quarter) and the implicit norm under n-1 policy. The implicit norm under n-1 from the fourth quarter of 1970 until the first quarter of 1972 is calculated as follows.

Holmes (1982) in a study of the Conservative Government of 1970-74 based on extensive interviews and analysis of speeches and statements claims the origins of the 'n-1' pay policy in Autumn 1970. It was nicknamed 'N minus 1' since the rough rule of thumb was that each pay settlement should be slightly less than the one before. He sets the beginning of N-1 as after the dustmen's strike in November 1970 and as ending after the miners' strike in February 1972.

The settlement of the dustmen's strike in 1970 was some 15 per cent. A literal translation of 'N-1' might then set the norm for pay in the public sector as 1 per cent lower for each successive settlement. However, this would imply a zero norm after a further period of 15 months and eventually a negative norm and this was clearly not the intention of the policy. Rather the intention was seen as a gradual reduction and a norm for the public sector over this period is formed by setting as initial norm of 14 per cent which then declines by 1 per cent in each quarter. Clearly this is rather an arbitary assumption but it seems to capture the spirit of 'n-1'.

The norm for public sector pay is then weighted with the 'free-market norm' for the private sector (i.e. based on previous wage inflation) to give an overall figure for the whole economy.

		% p.a.		
		Public sector	Private sector	Whole economy
1970	4	14.0 (for one month)	15.2	15.1
1971	1	13.0	13.5	13.4
	2	12.0	13.5	13.1
	3	11.0	10.5	10.6
	4	10.0	10.7	10.5
1972	1	9.0	10.5	10.1
	weight	.289	.711	

Following the collapse of n-1 the Conservative Government sought a voluntary pay policy but in effect a policy-off regime existed in the second quarter of 1972. The wage norm for this period is once again given by the previous quarter's rate of wage inflation. In August and September however, the Prime Minister, Mr. Heath, clearly announced an intention to operate a pay policy with a norm of £2 p.w. (representing some 6.9 per cent of average earnings). If this norm is applied to two months of the quarter with the no-policy norm used in the remaining month the result is a central norm of 8.6 per cent.

Freeze and further periods of policy

In November 1972 the attempt to persuade the TUC and CBI to agree to a voluntary policy failed and a 90 day standstill on wages and prices took effect. This gives an average norm for the fourth quarter of 1972 of 2.7 per cent. The standstill was extended by a further 60 days to end in March 1973, giving a zero central norm for the first quarter of 1973. In Stage 2 of the policy which started in April 1973 the central norm was set at £1 p.w. plus 4 per cent (equivalent to 6.9 per cent). Settlements due to be implemented during the period of standstill were allowed to operate and the policy allowed for an explicit exception to cover equal pay (with up to one-third of the male/female pay differential allowed to be removed). Other exceptions to the central norm were improvements in holidays; reductions in hours towards 40 hours a week and improvements in occupational pensions.

Stage 3 of the policy began after just a further six months in November 1973 with the central pay norm established as 7 per cent or £2.25 per week. As well as the exceptions included under Stage 2 there was a 1 per cent 'flexibility' margin and a cost-of-living safeguard (threshold provision). The central norm was equivalent to 7.9 per cent (see Appendix C).

In Appendix C the Pay Board's estimates of the effects of the exceptions to the Stage 2 and Stage 3 policy are given. The Pay Board's ex-post estimate was that the provision for equal pay increased the norm by about 1/3 per cent per quarter; the settlement for anomalies by 0.4 per cent by the end of Stage 3; and the flexibility margin by just over ½ per cent.

No ex-ante provision was made for anomalies so these are not included in the wage norm. The rules for equal pay stated that up to one third of the differential existing in December 1972 could be eliminated. The National Institute Economic Review for May 1974 (p.18) suggested that equal pay may have contributed for some 1½ per cent of the increase in rates of pay between November 1972 and February 1974, very close to the Pay Board's ex-post estimate. However, both these figures are very different from the ex-ante entitlement. For example, in 1973 the entitlement for female workers would have been an increase of over 30 per cent on account of equal pay clause and close to 10 per cent on overall earnings. The actual reduction in male/female differentials (see Mayhew, 1981) was in fact very slight in 1973 and 1974 and most rapid progress was made in 1975 after the end of Stage 3. In addition the nature of the policy norm itself under Stage 2 and Stage 3 (with its flat-rate element) would have increased female pay by 2.1 and 2.9 per cent per annum more than male pay. An extra allowance due to the policy itself seems inappropriate.

The full flexibility margin of 1 per cent is allowed for in the exceptions to the norm although the ex-post effects suggest a figure of one half this magnitude. Thresholds are added for the second quarter of 1974 (the first in which they were due) but not thereafter since the general provisions of Stage 3 were no longer being applied, although thresholds were still being paid.

The Social Contract 1974-75

Following the conflict with the miners in the winter of 1973/74 a general election was held (February 1974), resulting in a defeat for the Conservative Government. The pay policy was not formally abandoned until later in the year however and was followed by a period of the Social Contract when pay increases were intended to do no more than match price increases. For the period of the Social Contract therefore the pay norm is set at equivalent to last period's rate of price inflation (which according to the real wage pressure variable produces zero real wage increases, as intended by the policy). Between the publication of the Social Contract guidelines in December 1974 and the ending of the pay policy in June 1974 there was a period when no formal or informal policy existed however. For this period the wage norm is given by the standard policy-off value (i.e. equal to last period's rate of wage inflation).

Voluntary Restraint 1975-79

In the summer of 1975 the Labour Government announced a £6 per week pay limit from August. This policy lasted until July 1976 when it was superseded by Phase 2 which moved back to a percentage norm (5 per cent) but with upper and lower limits. After a further 12 months Phase 3 set a norm of 10 per cent and this was followed by a further 5 per cent norm from August 1978. Flat rate elements of these policies are translated into a percentage norm using estimates of the distribution of earnings from the New Earnings Surveys. Details are given in Appendix C . The values of the central norm thus calculated are 13 - 18 per cent for Phase 1 of the policy; 5 or 6 per cent for Phase 2; 10 per cent for Phase 3 and 5 per cent for Phase 4. Equal pay was made an exception to the policy throughout but like the Conservative policy of 1972-4 no specific allowance is made in the norm. The flat rate elements of the Phase 1 and Phase 2 policies are estimated to have increased female earnings by 6.6 and 1.4 per cent per annum respectively. The straight percentage norm of Phases 3 and 4 would have left no further sex differential drift from policy alone. Self-financing productivity was included as an exception under Phases 3 and 4 whilst some anomalies and low pay were exceptions from the central norm in Phase 4. None of these exceptions are included however as they were all non-specific in terms of allowable additions to the central norm.

1979, Clegg and a new approach

Following the election of the Conservative Government in May 1979 the formal incomes policy was abandoned in favour of a non-interventionist approach. However, the results of the Clegg Commission on Comparability, instituted under the previous administration were allowed to stand. The wage norm for the remainder of 1979 is calculated therefore by weighting together the various Clegg awards with the no-policy value of wages for the private sector.

Deferred settlements

The wage standstills of 1966 and 1972 allowed that settlements already made but not implemented could take place in the period after the wage freeze. Thus it is appropriate to include this effect in the wage norm since it is quantifiable in ex-ante terms. The commencement of both periods of standstill occurred part of the way through a quarterly period so that the wage norm for the first period of freeze is not zero (1.2 per cent for the 1966 freeze in 1966 Q3 and 2.7 per cent for the 1972 freeze in 1972 Q4). The position of pre-standstill settlements is quite complicated since some settlements are staged. In a simple world where there existed no delay between wage settlements and their implementation and where wage settlements were made annually at a fixed time of year then the impact of pre-standstill agreements during incomes policy periods would be zero. If a lag between settlements and implementation is allowed then the effect of pre-standstill agreements would be a function of the rate of wage inflation in the pre-standstill period and the average delay between settlements and implementation.

Thus $\dot{w}+ = \dot{w}_{t-1} \cdot (1-SL)$

where $\dot{w}+$ is the extra wage inflation due to pre-standstill settlements, and $\dot{w}_{t-1}$ is the rate of wage inflation in the previous period. In principle $\dot{w}_{t-1}$ should refer to pay settlements rather than the measured earnings increase. SL is the proportion of workers whose settlements and implementation dates both occur within the previous period. Thus (1-SL) is the proportion of the labour force receiving a settlement in the previous period but whose implementation date lies in the current period. With standard lengths of settlement but with implementation lags spreading over more than one period then $\dot{w}+$ becomes a more complex function of past rates of inflation, together with the distribution of the implementation lag over time.

The fact that contract length itself may vary, partly in response to incomes policies, further complicates the treatment of deferred settlements. In practice evidence from settlements of manual workers held on the Aberdeen database shows that the lag between settlement and implementation is very small except when incomes policies themselves lead to a deferment of the implementation date. Thus there is not a general problem involved in terms of wage settlements, although the actual increase in earnings paid in periods immediately prior and post changes in incomes policy rules will continue to reflect changes in the number of workers settling in each period as well as the average increases per settlement. This latter problem is one of specification of the wage relationship and need not detain us here.

Evidence from the Pay Board reports (see Appendix C) shows over 150 pre-standstill agreements between April and June 1973 covering just over 1 million workers. The number of pre-standstill settlements then fall until the beginning of Stage 3 when a substantial number of staged settlements became due between December 1973 and May 1974. Assuming that these settlements would have been made at the pre-standstill rate of inflation then given the number of workers affected the additional effect of wage inflation would have been 0.2 per cent in 1973 (2), 0.1 per cent in 1973 (3) and 1973 (4), 0.3 per cent in 1974 (1) and 0.1 per cent in 1974 (2).

Information on deferred settlements in 1966/67 is more difficult to come by. The National Institute (NIER August 1967) suggested that deferred settlements might increase wages by 1¼ per cent in the first quarter of 1967 and this estimate is consistent with the figure given in the White Paper relating to the freeze (Cmnd.3073 'Prices and Incomes Standstill') where six million workers were referred to as being affected by the allowance for deferred settlements. Thus 1¼ per cent is the chosen allowance for deferred settlements in 1967 Q1.

Table 5.3 Quantitative Indicators of Government and Trade Union Pressure

	Income references to the NBPI[a]	Number of claims submitted to TUC vetting committee[b]		Number of industrial stoppages[c] (thousands) Total	Wage disputes
1965 2	2	n.a.	1961	2,686	1,306
3	-	n.a.	1962	2,449	1,125
4	6	n.a.	1963	2,068	956
1966 1	2	n.a.	1964	2,524	1,208
2	-	n.a.	1965	2,354	1,180
3	8	n.a.	1966	1,937	883
4	4	n.a.	1967	2,116	986
1967 1	4	-	1968	2,378	1,230
2	6	103	1969	3,116	1,783
3	2	166	1970	3,906	2,465
4	3	121	1971	2,228	1,155
1968 1	4	60	1972	2,497	1,477
2	8	85	1973	2,873	1,462
3	10	83	1974	2,922	1,922
4	8	95	1975	2,282	1,318
1969 1	3	45	1976	2,016	875
2	4	56	1977	2,703	
3	3	52	1978	2,471	
4	2	59	1979	2,080	
1970 1	4	22			
2	6				

(a) Source: Fels (1972) (b) Source: Blackwell (1977) (c) Source: D.E. Year Books

In some cases there may have been an incentive to advance settlements in order to avoid a more severe phase of policy (e.g. the £6 p.w. policy of 1975). These questions of timing as distinct from the rules of the policy itself are discussed in Chapter 6.

5.3 Government pressure and trade union response

Preceding chapters have made it clear that it is inappropriate to measure the strength of any given incomes policy purely by the pressure it exerts on real wages. It is also very relevant to consider the stringency with which any government attempts to apply a given policy and the response of the trade union movement as a whole. For example, a policy which has trade union co-operation through TUC vetting of wage claims has a much greater ex-ante chance of success than has the same policy within a hostile trade union atmosphere.

The intensity of policy is therefore given as a function of indices of government pressure and trade union response shown in Table 5.4. These indices can only be measured subjectively although various quantitative pieces of information are used in their construction.

In forming the index of government pressure the following factors are relevant. First the sanctions behind the policy. Thus a purely voluntary policy would rank at the bottom of the range and a policy backed by a compulsory freeze at the top end of the range. Whether a policy is voluntary or compulsory is just one part of the index of sanctions. The form of monitoring is also important so that policies which are based on a close monitoring of pay awards rank higher than a policy with no mechanism for monitoring. Second the degree with which the Government attempts to enforce the policy. For example, the Government's attitude is given by its use of its powers such as the number of references to the NBPI.

Table 5.4 Indices of Government and TUC Pressure 1961-79

Year	Qtr	Government pressure (Index 0-10): Degree of formal controls	Government pressure (Index 0-10): General attitude	Composite index (Index 0-1) GPS	TUC general support (Index 0-1) TPS	Overall index (Index 0-1) IPS	Year	Qtr	Government pressure (Index 0-10): Degree of formal controls	Government pressure (Index 0-10): General attitude	Composite index (Index 0-1) GPS	TUC general support (Index 0-1) TPS	Overall index (Index 0-1) IPS
1961	1	2	3	0.25	0.2	0.225	1971	1	2	4	0.30	-	0.15
	2	2	3	0.25	0.2	0.225		2	2	4	0.30	0.1	0.20
	3	4	5	0.45	0.3	0.375		3	2	4	0.30	0.1	0.20
	4	4	5	0.45	0.3	0.375		4	2	4	0.30	0.2	0.25
1962	1	4	5	0.45	0.3	0.375	1972	1	2	4	0.30	0.2	0.25
	2	3	5	0.40	0.3	0.35		2	-	5	0.25	0.3	0.275
	3	3	5	0.40	0.3	0.35		3	-	5	0.25	0.3	0.275
	4	4	5	0.45	0.2	0.325		4	7	8	0.75	0.3	0.525
1963	1	4	5	0.45	0.2	0.325	1973	1	10	10	1.00	0.2	0.60
	2	4	5	0.45	0.2	0.325		2	10	10	1.00	0.2	0.60
	3	4	5	0.45	0.2	0.325		3	10	10	1.00	0.2	0.60
	4	4	5	0.45	0.2	0.325		4	10	8	0.90	0.2	0.55
1964	1	4	5	0.45	0.2	0.325	1974	1	10	7	0.85	0.2	0.525
	2	4	5	0.45	0.1	0.275		2	7	4	0.55	0.6	0.575
	3	4	5	0.45	0.1	0.275		3	-	3	0.15	1.0	0.575
	4	3	6	0.45	0.7	0.575		4	-	3	0.15	1.0	0.575
1965	1	3	7	0.50	0.9	0.70	1975	1	-	4	0.20	1.0	0.60
	2	3	7	0.50	0.9	0.70		2	-	4	0.20	1.0	0.60
	3	5	7	0.60	0.9	0.75		3	5	8	0.65	0.9	0.775
	4	6	7	0.65	0.9	0.775		4	5	8	0.65	0.9	0.775
1966	1	6	8	0.70	0.8	0.75	1976	1	5	8	0.65	0.9	0.775
	2	6	8	0.70	0.8	0.75		2	5	8	0.65	0.9	0.775
	3	10	10	1.00	0.7	0.85		3	5	8	0.65	0.8	0.725
	4	10	10	1.00	0.7	0.85		4	5	8	0.65	0.8	0.725
1967	1	8	10	0.90	0.7	0.80	1977	1	5	8	0.65	0.8	0.725
	2	8	10	0.90	0.7	0.80		2	5	8	0.65	0.8	0.725
	3	7	10	0.85	0.6	0.725		3	5	8	0.65	0.7	0.675
	4	7	10	0.85	0.6	0.725		4	5	8	0.65	0.7	0.675
1968	1	7	9	0.80	0.5	0.65	1978	1	5	8	0.65	0.6	0.625
	2	8	9	0.85	0.5	0.675		2	5	8	0.65	0.6	0.625
	3	8	8	0.80	0.4	0.60		3	6	8	0.70	0.5	0.60
	4	8	8	0.80	0.4	0.60		4	6	8	0.70	0.5	0.60
1969	1	7	7	0.70	0.4	0.55	1979	1	5	8	0.65	0.4	0.525
	2	7	7	0.70	0.4	0.55		2	3	3	0.30	0.3	0.3
	3	7	6	0.65	0.3	0.475		3	-	-	-	0.2	0.1
	4	7	6	0.65	0.3	0.475		4	-	-	-	0.2	0.1
1970	1	6	5	0.55	0.2	0.375							
	2	6	4	0.50	0.1	0.30							
	3	-	-	-	-	-							
	4	2	3	0.25	-	0.125							

Indications of the trade union response are based on the motions and votes at the TUC Annual Congress and, during the 1967-70 period, the use of the TUC's own vetting committee. Another quantitative indicator used to form a trade union response index is the number of industrial disputes. The paper by Davies (1979) concludes that the imposition of incomes policy has a significant impact in reducing strikes over pay issues with the ending of policy leading towards a sharp upsurge as workers attempt to make up for lost ground.

The two components of government pressure (sanctions and their use) are combined with equal weights as is the aggregate government variable with the TUC index to provide an overall index of incomes policy stringency. Treating both GPS and TPS as defined in Table 5.4 the overall index of policy (IPS) is given by

$$IPS = 0.5\,(GPS + TPS).$$

The following discussion describes how the indices for different policy periods have been derived.

5.3.1 The degree of formal controls

At the beginning of the period in question the existing institution was the Council on Prices, Productivity and Incomes, a three-man body. This had been established in 1957 with a function to review changes in prices and incomes but it did not report on specific cases, had no real powers and was largely educational. It therefore ranks quite low in order of degree of sanctions. The Council issued its final report in July 1961 and the 'pay pause' began, but with no institutional backing. The policy was voluntary and the Government was only able to use its powers in the public sector and in a few wage council industries within the private sector. The policy therefore ranks more highly than its predecessor but is still quite weak in terms of its sanction-power. The pay pause was followed by the formation of the National Incomes Commission which like the Council in Prices, Productivity and Incomes had no substantive powers. Its terms of reference were to review pay where the cost was met from the Exchequer or to examine retrospectively any private or public settlement referred to it by the Government. In all it produced five reports on four references. The era of the guiding light policy therefore ranks somewhere between the pre-pay pause policy and the pay pause itself.

After the election of the Labour Government in the autumn of 1964 the National Incomes Commission remained until the formation of the National Board for Prices and Incomes in early 1965 but the nature of policy itself was increasingly voluntary.

When the NBPI was first established its role, like the NIC was to review the cases referred to it by the Government and it had no independent role. Initially, powers of sanction were very limited but from September 1965 the Government was able to impose a delay until the Board had reported. From November 1965 the 'early warning' system was proposed whereby all important wage and price increases were notified in advance. In July 1966 the Government announced a standstill on wages and prices with Part IV of the 1966 Prices and Incomes Act available to cover penalties for violation. The index for this six-month period is therefore set at its maximum value. In 1967 Part IV of the 1966 Act was allowed to lapse although the powers of delay were extended to a maximum of seven months. In 1968 powers of delay were further extended to twelve months but then reduced back to four months at the beginning of 1970. The index of sanctions reflects these changes in powers. In the middle of 1970 the NBPI was abolished along with powers of delay but the Government used its power in the public sector during the period of the n-1 policy. During 1972 it had no powers at all whilst it sought for a voluntary agreement.

In November 1972 the Conservative Government introduced a statutory freeze which was followed by two further stages of policy, both statutory, and both monitored by new institutions (the Pay Board and the Price Commission). Unlike the NBPI which could only examine cases referred to it, the Pay Board monitored all pay settlements and so the degree of control between 1973 and early 1974 was tighter than occurred after the freeze of 1966. With the change of government in 1974 and the abolition of the Pay Board, the degree of formal controls is ranked at its minimum value. The policy which succeeded the Social Contract in 1975 (the £6 p.w. policy) remained voluntary but the Government was able to use the Price Commission as a weapon to disallow price increases in excess of the norm so that the degree of controls increased. Further increases in powers were attempted in 1978 as the Government tried to discriminate against employers who broke the pay norm but this was subsequently defeated in Parliament. Finally, the election of the Conservative Government in May 1979 led to a complete abolition of all forms of pay control so that the index returns to zero again.

5.3.2 Government attitude

Chapter 4 outlines the development of policy over the period and the index of attitude shown in Table 5.4 is essentially based on that description.

Until the pay pause of 1961 the prevailing approach was one of belief that inflation was a problem and that some restraint of wage increases would be beneficial but the Government was not prepared to intervene much. With the pay pause and the formation of the NIC this attitude changed a little but the Government did little to use the NIC as a major instrument of policy. With the replacement of the NIC by the NBPI in 1965 and the introduction of an early warning system for wages and attitudes hardened and a further increase in toughness occurred in 1966 when the Government passed legislation enabling it to delay wage increase With the pay freeze of 1966 and the policy of severe restraint in 1967 the Government was attempting to apply policy very rigorously but through 1968 and 1969 the Government became more preoccupied with industrial relations legislation and by the beginning of 1970 the Government was by-passing the NBPI to a large extent and allowing through wage increases far in excess of the policy norm (NBPI Fifth General Report). The number of references to the NBPI in the second half of 1969 and in 1970 is in fact misleading as none of these related to particular pay settlements. The new Conservative administration made no attempt initially to impose any controls but then adopted its 'n-1' policy which collapsed in early 1972. Thereafter it searched quite hard to achieve a voluntary policy but failure in this search led to the statutory freeze beginning in November 1972. This freeze and its successive policy stages were firmly applied until the three-day week and general election of early 1974.

Yet again, the incoming Government (Labour) adopted a free-market approach to wages but by 1975 it had become determined to operate a formal policy rather than the 'understandings' of the Social Contract. Throughout 1976 to 1978 incomes policy was seen as an important ingredient in economic policy but the new Conservative administration of 1979 again adopted a free-market approach.

5.3.3 Trade union response

The TUC having given evidence to the Council on Prices, Productivity and Incomes later refused to have anything to do with it. They remained opposed to the pay pause and subsequent formation of the NIC and refused to give any co-operation to this body, although Panitch (1976) notes that this did not turn into active hostility to the Conservative Government. In 1963 the TUC General Council Report stated the 'need for policies to ensure that money incomes, wages, salaries and profits as a whole rise substantially less rapidly than in the past' but they also declared 'complete opposition to any form of wages restraint'. As the General Election approached in 1964 the TUC was in even less sympathetic mood towards any form of incomes policy under the existing government. However, two months before the election it gave overwhelming support to an incomes policy under a planned economy introduced by a Labour Government, although it explicitly opposed any policy which had wage restraint or limitations on collective bargaining as its aim (Panitch, 1976, p.61).

After the election of the Labour Government the TUC was involved in the drafting of the statement of intent which was the basis for the incomes policy which developed in 1965. The TUC was also involved in drafting the Prices and Incomes White Papers. The TUC endorsed the formation of the NBPI and agreed to the wage norm of 3-3½ per cent. The mood of co-operation continued through 1965 and the General Council agreed (although reluctantly) to an early warning system and to powers to delay wage increases. Under the early warning system the TUC set up its own vetting committee which operated from October 1965 to January 1970 with a break for the wage freeze of 1966. The vetting committee had several possible courses of action: it could make no observation on a claim; it could merely point out the Government's wage criteria; it could make specific comments on the claim and ask the union to reconsider; or it could ask the union concerned to meet with the committee. In fact, the TUC vetting committee operated far more as a monitoring agency as the NBPI only examined cases referred to it, and, in any case, could only deal with a limited number of references at any given period of time. The TUC had indicated, however, that it would be flexible in its treatment of the norm in its vetting process. The powers of the incomes policy committee were largely those of moral sanctions as it had no direct means of guaranteeing union adherence.

The TUC General Council reluctantly gave support to the pay freeze of July 1966 and at the Annual Congress the freeze was accepted only by a majority of 4.9 to 3.8 million. Following the end of the freeze, the TUC incomes policy committee resumed its vetting but the TUC was becoming more critical of policy. In general it opposed the introduction of statutory powers and in particular it did not approve of the NBPI's guidelines for productivity agreements as an exception to the nil pay norm. The TUC also wanted to define the low-paid as those earning less than £15 for a standard working week but the Government insisted that this figure was far too high and refused to define the low-paid. The TUC also adopted its own norm for vetting purposes of 7 per cent and various critical motions were passed at its Annual Congress.

The Committee examined 340 claims notified to it during 1967 and withheld approval from 40 per cent of claims but this figure fell through 1968. In the period between May 1967 and January 1968 some 441 claims were examined and only 126 passed but most unions ignored the TUC view and in the second half of 1968 the committee found 309 out of 327 claims as non-objectionable and only sent 18 claims to its panel which usually passed the claims. For 1968 the TUC had adopted its own norm of 6 per cent. The 1968 Annual Congress was very critical of government policy and a motion supporting the TUC voluntary policy was only passed by the meagre majority of 34,000 votes. Industrial disputes (and particularly those which were wage disputes) rose in 1968 and even more strongly during 1969. During 1969 the TUC became more and more opposed to the reactivation of Part II of the 1966 Act (which gave the Government powers of delay) and argued that the proposed White Paper of December was unacceptable.

In February 1970 the TUC finally abandoned its own vetting and the decade thus began with a trade union opposed to any form of incomes policy, whether voluntary or statutory. Although the Conservative Government of Mr. Heath in 1970 had no intention of operating price and incomes controls its attitude towards industrial relations legislation in particular and trade unions in general made the trade union movement very antagonistic towards it. By 1972, however, the TUC were looking to regain their influence with the Government and were prepared to negotiate over a genuinely voluntary policy (Panitch, 1976, p.225). However, there was an air of suspicion present in the talks and they broke down over the size of the proposed norm and because the TUC wanted a voluntary pay policy but a statutory policy on prices. The TUC denounced the statutory policy which was finally introduced and refused to sit representatives on either the Pay Board or the Price Commission. In addition a special Congress in March 1973 required the General Council to lead a one-day general strike against the policy. The TUC continued to talk to the Government over Stage III of its policy, but principally to make its views known. Finally Stage III came to an abrupt end with the Conservative Government's defeat at the general election of 1974 following the dispute with the miners. The new Labour Government had already been working on a 'Social Contract' with the trade unions whilst in opposition and now began to apply this understanding in practice. The TUC itself was responsible for vetting claims and was a more than willing partner to this voluntary policy. When, in 1975, this understanding was seen to be too vague and leading to an acceleration, rather than deceleration in the pace of wage settlements the TUC were instrumental in designing a more formal policy and they agreed to oppose any settlement in excess of this £6 p.w. pay norm. With the succeeding phase of policy in 1966 the TUC again supported the specific wage limit but with less enthusiasm than in 1975. By 1977 their support had diminished to one of a general nature and they no longer endorsed the specific limiting figure. In the following year the policy had no TUC backing at all.

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5.4 Comparison of the actual outturn in wages with the policy norm

In this section we briefly examine the outcome for wages under different periods of policy and the relationship of the outcome with different policy norms. At this stage no attempt is made to reconcile discrepancies between the outcome and the policy norm in terms of the pressure of policy and/or the general failure of policy. This is dealt with by more formal analysis in Chapter 6. The purpose of this section is merely to prepare the ground for the more formal analysis and to illustrate the dependence of statements regarding the actual outcome of wage inflation on the actual measure of wages chosen. Thus in Table 5.5 wage increases are shown for each policy episode for five alternative measures of wages (a description of these measures is given in Appendix D. The average wage and salary measure is the most comprehensive measure of earnings actually received as the average weekly earnings series has substantially less coverage. The index of basic weekly wage rates only refers to manual workers and is base weighted and whilst the CEPG and Aberdeen settlement indices are conceptually more appealing they also only cover manual workers.[3]

All the series are seasonally unadjusted and consequently very short-term movements may be due to seasonal factors which cannot be adequately dealt with in this informal analysis.

In Table 5.6 a more precise definition of the actual increase in earnings and wage rates is given by using monthly data. However, this more precise definition is only possible for two of the alternative measures of wages, namely the index of average weekly earnings and the index of basic weekly wage rates.

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Table 5.5 Wages and Earnings in Selected Policy Periods

% increase at annual rates

Policy Period		Basic weekly wage rates	Average weekly earnings	Average wages and salaries	CEPG wage settlements	Aberdeen wage settlements	Wage norm
1961(3)-1962(1)	Pay Pause	3.0	n.a.	3.1	-3.2	7.4	-
1962(2)-1963(3)	Guiding Light(1)	3.4	n.a.	4.7	1.7	4.7	2.5
1963(4)-1964(4)	Guiding Light(2)	4.7	6.2	8.1	9.5	6.3	3.5
1965(2)-1966(2)	Early Warning	4.9	8.0	7.5	3.6	5.5	3.5
1966(3)-1967(1)	Standstill	2.0	-2.5	5.8	9.2	4.7	0.6
1967(1)-1967(3)	Severe restraint	3.2	6.7	5.7	4.2	5.2	0.6
1967(3)-1968(1)	Restraint	9.0	7.9	7.0	2.2	6.3	-
1968(2)-1969(4)	Moderate restraint	4.9	7.4	8.3	3.7	7.1	3.5
1970(1)-1970(2)	Little restraint	12.4	12.5	14.2	24.6	11.4	4.5
1970(4)-1972(1)	N-1 Policy	12.8	10.4	8.5	9.7	11.1	11.5
1972(4)-1973(1)	Stage 1	10.4	12.3	11.2	10.0	11.1	1.3
1973(2)-1973(4)	Stage 2	13.1	12.9	14.3	10.3	10.2	7.0
1973(4)-1974(1)	Stage 3	19.3	16.3	14.4	12.8	15.6	8.8
1974(1)-1975(3)	Social Contract	30.8	28.3	29.9	35.2	15.0	16.3
1975(3)-1976(3)	Phase 1	18.2	13.5	12.4	13.4	n.a.	12.4
1976(3)-1977(3)	Phase 2	5.0	8.6	9.5	11.2	n.a.	6.3
1977(3)-1978(3)	Phase 3	16.2	16.1	14.8	11.9	n.a.	9.2
1978(3)-1979(2)	Phase 4	13.1	17.4	14.9	15.8	n.a.	6.2

Notes: The wage norm is described in section 5.2 and in Table 5.2

A description of the various wage and earnings series is given in Appendix D. They are all unadjusted for seasonal variation.

At the beginning of the decade whilst the Council on Prices, Productivity and Incomes was in operation the increase in wage rates was considerably lower than that of earnings or that indicated by both measures of wage settlements. During the pay pause the CEPG measure of wage settlements actually shows a fall in wages whilst the Aberdeen index shows a sharp increase. Under the first part of the policy of the 'Guiding Light' both the CEPG measure of settlements and the index of wage rates show an increase in wages compatible with the norm whilst the average wage measure and the Aberdeen index show an excess of around 2 per cent per annum. The measures all consistently show an overshoot during the second half of the guiding light era, with the most modest increases being shown by the wage rate series. [4]

During the initial period of the Labour Government there is reasonably close agreement between the wage rates and settlement measures and the implicit wage norm of 3½ per cent but not for the earnings series.

With the exception of the index of average weekly earnings all the measures show some increase over and above the wage norm during the pay standstill of 1966 and both the earnings series and the basic weekly wage rates series show a considerable rebound in wages during the period of severe restraint whilst this is not apparent from the wage settlement data. [5] The policy of little restraint appears to be just that with a major acceleration of wages under all definitions and with some easing when policy was finally removed in 1970. Given the implicit norm calculated for the 'n-1' episode wage experience during this period appears to have been consistent with the demands of policy.

Stage 1 of the Conservative policy in 1972 seems, on the

Table 5.6 Earnings and Wages by More Detailed Policy Episodes

% p.a.

		Average Weekly Earnings	Basic Weekly Wage Rates
Pay Pause	1961 July - 1962 March	n.a.	2.5
Guiding Light (1)	1962 April - 1963 Sept.	n.a.	2.9
Guiding Light (2)	1963 Oct. - 1964 Dec.	6.4	4.7
Early Warning	1965 April - 1966 July	8.6	5.4
Standstill	1966 July - 1967 January	-0.4	2.5
Severe Restraint	1967 Jan. - 1967 June	5.7	0.6
Restraint	1967 July - 1968 March	9.1	10.9
Moderate Restraint	1968 March - 1969 Dec.	8.8	5.7
Little Restraint	1970 Jan. - 1970 June	14.4	10.9
N-1 Policy	1970 Nov. - 1972 March	10.6	11.9
Stage 1	1972 Nov. - 1973 March	5.9	3.7
Stage 2	1973 April - 1973 Nov.	17.6	17.7
Stage 3	1973 Nov. - 1974 Feb.	..[1]	6.8
Social Contract	1974 Feb. - 1975 July	29.5	33.0
Phase 1	1975 Aug. - 1976 July	13.9	18.5
Phase 2	1976 Aug. - 1977 July	8.9	4.8
Phase 3	1977 Aug. - 1978 July	16.3	16.0
Phase 4	1978 Aug. - 1979 May	14.5	11.1

Note: (1) affected by 3 day week.

Source: DE Gazettes; Historical Abstract.

face of it, to have been unsuccessful in terms of all the measures. The discrepancy between all the measures and the wage norm is much less marked during Stage 2 of the policy but widens again during Stage 3. A major acceleration in earnings and wage rates then occurred for wages and earnings during the era of the Social Contract (with the exception of the Aberdeen settlement series which records no acceleration but which would do so if staged settlements were included) but during Phase 1 of the Labour Government's policy of 1975 the wage increase was reasonably close to the wage norm with the greatest discrepancy being recorded for wage rates. In contrast the wage rates series records the greatest degree of 'success' for Phase 2 whilst there is a little more slippage in the other series. Slippage then appears to have increased throughout Phases 3 and 4 of the policy.

Comparison of the actual outturn of wages with the notional wage norm also depends on the method of differencing as well as on the actual measure of wages chosen. In the preceding discussion the implicit model has been one of quarterly differencing but with the measures expressed in terms of an annual rate. However, if the implicit model is one of annual changes then the interpretation of the outcome is somewhat different.[6] For example, if the wage norm of zero for 1966 (4) were related to the level of earnings one year earlier the implied rate of increase would be 1½ per cent.

Table 5.7 shows the divergence of actual earnings from the implied wage norm under various assumptions. The first column of Table 5.7 relates the divergence between actual earnings and the predicted outcome for earnings if the wage norm were applied to actual earnings one year earlier. Under this interpretation of policy, events before the previous year are neglected but any 'overshooting' in the current year has to be remedied within the

Table 5.7 Actual Earnings and Wage Entitlements under Various Assumptions

	STRICT POLICY INTERPRETATION[1]	LOOSE POLICY INTERPRETATION[2]	ENTITLEMENT AS ANNUAL RATE[3]		STRICT POLICY INTERPRETATION[1]	LOOSE POLICY INTERPRETATION[2]	ENTITLEMENT AS ANNUAL RATE[3]
1961 1	-1.5	0.5	7.6	1971 1	-0.1	3.0	16.9
2	-0.4	-0.9	6.6	2	2.4	-0.7	9.7
3	-5.3	-0.3	5.2	3	-1.1	-0.3	11.5
4	-6.1	-2.6	3.7	4	-0.2	-0.9	9.7
1962 1	-4.8	0.7	5.7	1972 1	-0.4	2.4	13.2
2	-1.3	-0.9	2.9	2	-1.5	-2.7	9.1
3	-2.3	-0.7	4.2	3	-1.7	0.8	11.4
4	-1.8	-1.4	2.9	4	-8.8	-4.6	7.5
1963 1	-1.7	1.4	5.7	1973 1	-11.1	0.1	12.6
2	-1.7	-0.9	3.3	2	-4.9	-3.6	8.6
3	-1.6	-0.6	3.5	3	-5.8	-0.3	12.3
4	-1.5	-2.0	2.9	4	-3.9	-2.7	9.8
1964 1	-2.7	0.5	6.8	1974 1	-3.7	1.7	15.4
2	-3.0	-1.0	5.6	2	-3.4	-3.7	10.1
3	-2.8	-0.3	6.2	3	-5.7	-4.4	15.9
4	-3.4	-2.5	4.4	4	-9.5	-6.9	20.3
1965 1	-2.6	1.2	7.5	1975 1	-14.3	-2.7	34.1
2	-2.7	-1.1	5.3	2	-8.3	3.4	35.5
3	-2.9	-0.5	6.1	3	-8.5	-1.6	26.2
4	-2.8	-2.4	3.9	4	-3.5	0.6	18.6
1966 1	-4.2	-0.3	7.7	1976 1	1.3	1.2	13.7
2	-5.4	-0.4	6.9	2	-1.1	-0.5	14.5
3	-6.1	1.3	6.2	3	-3.6	-1.2	11.0
4	-6.7	-3.7	1.5	4	-5.7	-0.9	10.9
1967 1	-1.6	-1.0	4.5	1977 1	-5.7	-0.7	11.1
2	-5.4	-0.1	1.7	2	-4.2	-0.8	9.4
3	-6.1	0.8	6.8	3	-0.9	-0.5	8.9
4	-6.6	-3.6	2.5	4	-	-0.4	9.6
1968 1	-8.6	0.2	8.4	1978 1	-1.0	-0.7	10.3
2	-2.6	-0.9	6.1	2	-3.8	-2.6	11.4
3	-2.9	0.7	7.4	3	-7.1	-1.5	13.2
4	-3.0	-5.0	2.9	4	-8.4	-1.3	13.1
1969 1	-2.7	0.9	6.6	1979 1	-8.8	-2.3	12.5
2	-3.5	-5.2	6.3	2	-5.1	-2.3	11.8
3	-3.4	1.6	8.1	3	-2.4	-2.0	14.8
4	-4.9	-5.0	3.5	4	-1.9	-0.8	19.1
1970 1	-3.5	0.9	9.3				
2	-8.0	-5.2	7.6				
3	-1.4	1.6	7.1				
4	1.4	-0.9	12.5				

Notes: Actual earnings are measured by average wages and salaries.

1. Earnings are increased by the wage norm (T.5.2) using earnings one year earlier as base. The entitlement is then expressed as a % difference from actual earnings.
2. Earnings are increased by the wage norm converted to a quarterly figure and applied to the previous quarter's level of earnings. The entitlement is then expressed as a % difference from actual earnings.
3. The entitlement under (2) is expressed as an annual rate using earnings one year earlier as base.

current quarter. This is quite a strict interpretation as the introduction of a zero norm, say, would require a fall in earnings in the current period for the requirement of policy to be met. The second column is more realistic and shows the implied level of earnings using the wage norm applied to the previous quarter's level of actual earnings. The third column then shows the implied actual rate from column (2), using last year's earnings as base.

5.5 Description of the incomes policy measures

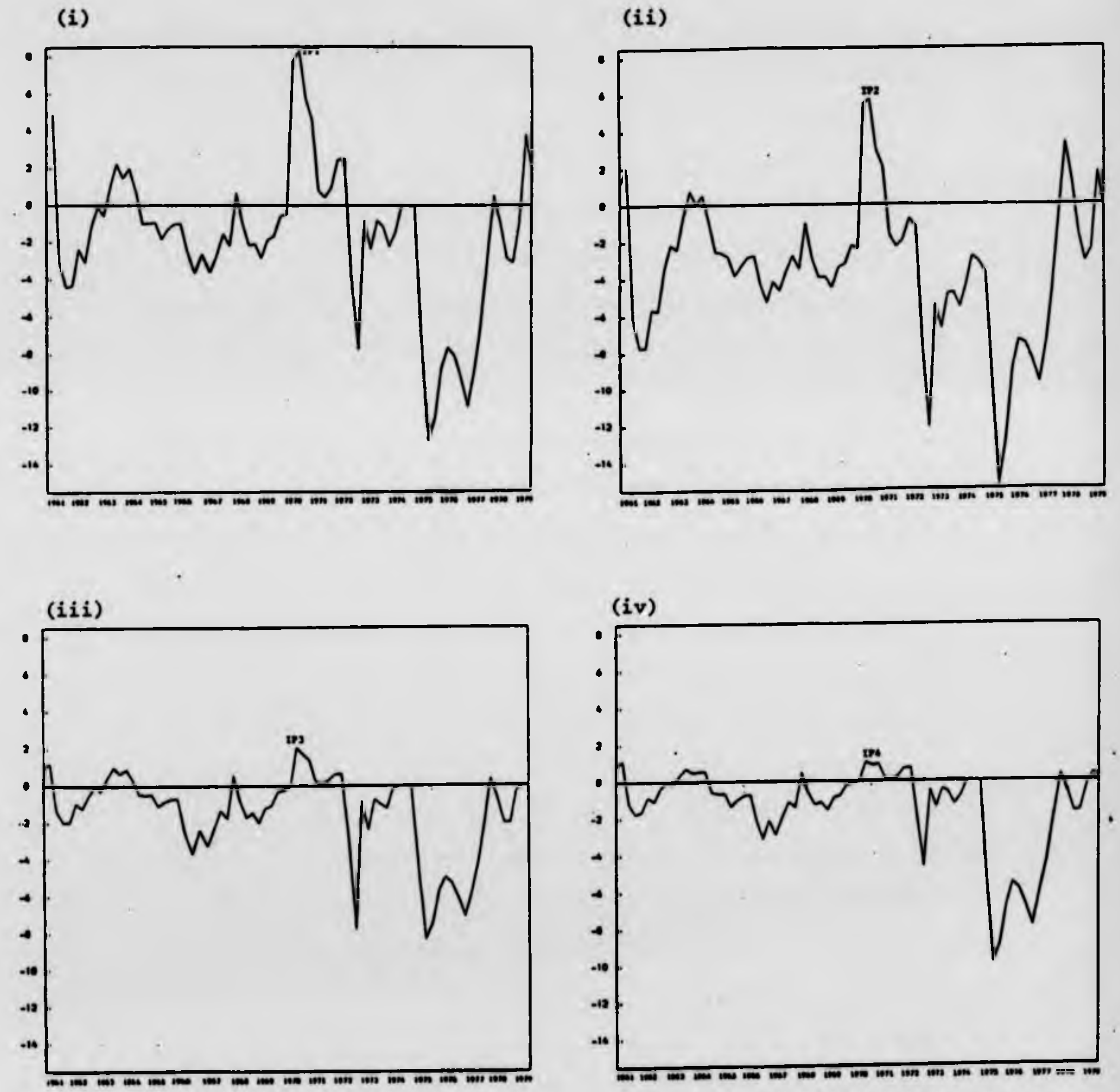
The wage norm for the period as a whole was shown in Table 5.2 and the indices of Government pressure and TUC response in Table 5.4. The various incomes policy measures that are appropriate for use in aggregate wage equations are set out in Table 5.8. These are also shown graphically in Figure 5.1.

Several alternative measures are presented. The first (IP1) shows the real wage pressure exerted at different periods of policy by deducting the rate of price inflation in the preceding period from the wage norm. A second measure (IP2) allows for the fact that real wages are expected to grow over time and a moving average of real wages is deducted from IP1.

Thus $IP2 = \dot{wn}_t - \dot{p}_{t-1} - \frac{1}{n}\sum_{i=1}^{n} (\dot{w} - \dot{p})_{t-i}$

The third measure, IP3, is derived from a product of the real wage pressure variable and the index of government pressure (GPS) whilst IP4 uses the product of IP1 and the overall index, IPS. The measure IP3 is less general than IP4 but the two measures are quite similar. A weak intensity of policy (IPS) scales down the effect of the real wage pressure. Comparable measures to IP3 and IP4 using real wage pressure as IP2 can also be derived but these are not shown in Table 5.8.

Figure 5.1 **Incomes Policy Measures**



The measures generally have a negative sign which implies a downward pressure on wages but very weak periods of policy can have a positive influence suggesting a contributory influence to higher inflation.

At the beginning of the period under consideration policy is seen to be quite loose with a high implicit wage norm but the introduction of the pay pause leads to a considerable tightening during 1961. All of the measures shown in Table 5.8 indicate a tightening of policy in late 1962 followed by some easing in late 1963/early 1964 as the wage norm was increased. The slowdown in trend real wages through 1962 produces a more severe effect on policy using the IP2 measure than is the case from IP1. The easing of pressure continues until late 1964 and the election of the Labour Government, following which the intensity of policy is increased but remains fairly steady throughout 1965 and the first half of 1966. The increase in intensity stems from both an acceleration of prices relative to the wage norm (measure IP1) and the more sympathetic response of the TUC to Government policy.

The stance of policy then becomes more restrictive during the second half of 1966 and in early 1967 following the period of standstill and severe restraint where a low wage norm is accompanied by a high degree of formal control and by a reasonably sympathetic trade union movement. Policy then weakens in early 1968 following the higher nominal wage norm but then tightens again throughout the remainder of 1968 and the beginning of 1969 as the price effects of the devaluation start to appear and increase real wage pressure for the unchanged wage norm. However, the gradual weakening of the intensity of policy coupled with an increase in the wage norm at the beginning of 1970 leads to an easing of incomes

Table 5.8 Measures of Incomes Policy and its Strength 1961-1979

% per annum unless otherwise indicated

		IPQ[a]	IPS[b]	IP1	IP2	IP3	IP4	Earnings	Prices	Real wages[c]
1961	1	5.4	0.2	3.7	1.1	0.9	0.9	7.0	2.2	4.5
	2	7.1	0.2	4.9	2.0	1.1	1.2	7.5	3.0	1.4
	3	-	0.4	-3.0	-6.1	-1.2	-1.4	5.6	4.4	1.8
	4	-	0.4	-4.4	-7.7	-1.8	-2.0	6.5	4.3	0.8
1962	1	-	0.4	-4.3	-7.7	-1.6	-2.0	5.0	4.9	-1.4
	2	2.5	0.4	-2.4	-5.6	-0.6	-0.9	3.9	5.6	7.8
	3	2.5	0.4	-3.1	-5.8	-1.0	-1.2	5.0	3.7	-0.1
	4	2.5	0.3	-1.2	-3.5	-0.4	-0.5	4.4	2.6	1.5
1963	1	2.5	0.3	-0.1	-2.2	-	-	4.3	3.1	1.9
	2	2.5	0.3	-0.6	-2.4	-0.2	-0.3	4.2	1.5	2.2
	3	2.5	0.3	1.0	-0.6	0.3	0.4	4.2	1.3	3.6
	4	3.5	0.3	2.2	0.8	0.7	1.0	5.0	2.0	2.8
1964	1	3.5	0.3	1.5	-	0.5	0.7	6.4	1.5	4.9
	2	3.5	0.3	2.0	0.5	0.6	0.9	6.7	2.7	3.4
	3	3.5	0.3	0.8	-0.9	0.2	0.3	6.5	4.5	0.6
	4	3.5	0.6	-1.0	-2.5	-0.6	-0.5	7.1	4.5	2.2
1965	1	3.5	0.7	-1.0	-2.6	-0.7	-0.5	6.3	4.4	1.6
	2	3.5	0.7	-1.0	-2.8	-0.7	-0.5	6.4	5.3	-0.4
	3	3.5	0.8	-1.8	-3.8	-1.4	-1.1	6.6	4.8	-0.1
	4	3.5	0.8	-1.3	-3.3	-1.0	-0.8	6.5	4.5	-0.9
1966	1	3.5	0.8	-1.0	-2.8	-0.8	-0.7	8.1	4.5	1.4
	2	3.5	0.8	-1.0	-2.8	-0.7	-0.7	7.4	3.7	2.7
	3	1.2	0.9	-2.5	-4.3	-2.1	-2.5	4.9	3.7	1.1
	4	-	0.9	-3.7	-5.3	-3.1	-3.7	5.4	3.9	1.8
1967	1	1.3	0.8	-2.6	-4.1	-2.1	-2.4	2.9	3.6	-1.1
	2	-	0.8	-3.6	-4.6	-2.9	-3.3	5.7	2.7	2.1
	3	-	0.7	-2.7	-3.6	-1.9	-2.3	6.5	1.5	3.9
	4	-	0.7	-1.5	-2.7	-1.1	-1.3	7.1	2.2	3.4
1968	1	-	0.7	-2.2	-3.5	-1.4	-1.8	9.4	2.8	6.3
	2	3.5	0.7	0.7	-1.0	0.5	0.6	6.2	4.5	1.7
	3	3.5	0.6	-1.0	-2.9	-0.6	-0.8	6.6	5.7	-1.1
	4	3.5	0.6	-2.2	-3.9	-1.3	-1.7	6.7	5.6	-0.7
1969	1	3.5	0.6	-2.1	-3.9	-1.1	-1.5	6.4	6.4	-0.7
	2	3.5	0.6	-2.9	-4.5	-1.6	-2.0	7.2	5.4	1.2
	3	3.5	0.5	-1.9	-3.4	-0.9	-1.2	7.3	5.1	1.5
	4	3.5	0.5	-1.6	-3.2	-0.8	-1.1	8.8	5.1	3.0
1970	1	4.5	0.4	-0.6	-2.2	-0.2	-0.3	8.3	5.0	2.4
	2	4.5	0.3	-0.5	-2.4	-0.1	-0.2	13.6	5.9	5.6
	3	13.6	-	7.7	5.5	-	-	15.2	6.8	7.5
	4	15.1	0.1	8.3	5.7	1.0	2.1	13.5	7.7	5.9

		IPQ[a]	IPS[b]	IP1	IP2	IP3	IP4	Earnings	Prices	Real wages[c]
1971	1	13.4	0.2	5.7	2.9	0.8	1.7	13.5	8.5	3.4
	2	13.1	0.2	4.6	2.1	0.9	1.4	10.5	9.8	1.4
	3	10.6	0.2	0.8	-1.7	0.2	0.2	11.8	10.1	2.1
	4	10.5	0.3	0.4	-2.3	0.1	0.1	10.7	9.2	1.2
1972	1	10.1	0.3	0.9	-1.9	0.2	0.3	10.5	8.0	3.4
	2	10.5	0.3	2.5	-0.8	0.7	0.6	12.2	6.1	7.7
	3	8.6	0.3	2.5	-1.2	0.7	0.6	10.4	6.5	5.5
	4	2.7	0.5	-3.8	-7.9	-2.0	-2.8	12.7	7.7	6.4
1973	1	-	0.6	-7.7	-12.1	-4.6	-7.7	12.5	7.9	5.0
	2	7.1	0.6	-0.8	-5.4	-0.5	-0.8	12.7	9.4	2.3
	3	7.0	0.6	-2.4	-6.7	-1.4	-2.3	13.5	9.2	3.5
	4	8.4	0.6	-0.8	-4.8	-0.5	-0.7	12.7	10.4	1.0
1974	1	9.2	0.5	-1.2	-4.8	-0.6	-1.0	13.4	12.7	0.4
	2	10.5	0.6	-2.2	-5.6	-1.3	-1.2	14.4	15.8	-3.0
	3	14.4	0.6	-1.4	-4.4	-0.8	-0.2	21.3	16.9	0.5
	4	16.9	0.6	-	-2.8	-	-	29.2	18.1	4.3
1975	1	18.1	0.6	-	-3.1	-	-	37.8	20.3	10.9
	2	20.3	0.6	-	-3.8	-	-	31.1	24.3	1.8
	3	17.3	0.8	-7.0	-10.3	-5.5	-4.6	28.2	26.6	-2.4
	4	13.8	0.8	-12.8	-15.3	-9.9	-8.3	17.9	25.3	-7.7
1976	1	13.8	0.8	-11.5	-12.9	-8.9	-7.5	12.4	22.5	-9.8
	2	13.8	0.8	-8.7	-8.9	-6.8	-5.7	15.1	15.9	-2.8
	3	8.3	0.7	-7.6	-7.3	-5.5	-5.0	12.4	13.7	0.4
	4	5.6	0.7	-8.1	-7.6	-5.9	-5.3	11.9	15.0	-2.7
1977	1	5.6	0.7	-9.4	-8.5	-6.8	-6.1	12.0	16.5	-4.1
	2	5.6	0.7	-10.9	-9.7	-7.9	-7.1	10.2	17.4	-5.0
	3	8.5	0.7	-8.9	-7.5	-6.0	-5.8	9.5	16.5	-5.3
	4	10.0	0.7	-6.5	-4.6	-4.4	-4.2	10.0	13.0	0.8
1978	1	10.0	0.6	-3.0	-0.8	-1.9	-2.0	11.1	9.4	3.8
	2	10.0	0.6	0.6	3.3	0.3	0.4	14.3	7.7	8.4
	3	6.7	0.6	-1.0	1.2	-0.6	-0.7	14.8	7.9	9.3
	4	5.0	0.6	-2.9	-1.7	-1.7	-2.0	14.6	8.1	7.1
1979	1	5.0	0.5	-3.1	-3.1	-1.6	-2.0	15.1	9.6	7.4
	2	8.6	0.3	-1.0	-2.5	-0.3	-0.3	14.5	10.6	4.9
	3	14.4	0.1	3.8	1.7	0.4	-	17.2	16.0	1.2
	4	17.8	0.1	1.8	-0.3	0.2	-	20.1	17.2	4.1

Notes: (a) wage norm (b) policy intensity (c) post-tax policy pressure. The end of the formal policy in 1970 and the election of a Conservative Government committed not to interfere with the normal processes of wage bargaining sees a considerable easing of policy in 1970, reduced a little during the period of 'n-1'. The wage freeze of 1972 leads to quite a severe restrictive effect at the end of 1972/beginning of 1973 but this is then moderated considerably through 1973 as the wage norm is increased from the zero norm of the freeze. The pressure of policy then increases a little during early 1974 until the period of the Social Contract when by definition real wage pressure is zero.

Set against the very rapid rates of price inflation in 1975 the first phase of the Labour Government's policy in summer 1975 is seen to be very restrictive in terms of real wage pressure, and is also accompanied by a high intensity of policy. When allowance is also made for the slowdown in the trend rate of growth in real wages the pressure of policy is seen to be even greater (IP2). The restrictive pressure of policy remains throughout 1976 and 1977 with a lowering of the wage norm in 1975. The increase in the norm in late 1977 together with some dissatisfaction by the TUC with policy leads to a reduction in pressure during 1978 with some tightening occurring during late 1978 and early 1979 with a lower wage norm.

5.6 Summary

An explicit wage norm can be observed for much of the period and implicit norms can be calculated for some of the remaining periods. Thus there are very few genuine policy "off" periods, mainly in 1960 and mid 1970, early 1972 and in the second half of 1979. The chapter describes how the various pieces of information available can be pieced together to form measures of the stance of incomes policy with particular attention being paid to the role of deferred pay settlements under incomes policy. Some of the measures presented incorporate the intensity of policy and trade union response.

The resultant policy measures reveal considerable variation in policy pressure over the period and this casts doubts on methods which assume a relatively high degree of homogeneity between policy periods. The most intense and prolonged period of policy pressure implied by the measures of policy developed in this chapter were between 1975 and 1977 with weaker and short-lived periods of intensity in 1976-7 and in 1972-3. The least restrictive policy periods suggested are those in 1963 and in 1970-2. In relative terms policy in these periods may have contributed to higher and not lower wage inflation. Whilst the alternative measures of policy differ in absolute size they do indicate quite similar rankings of policy tightness over the period.

Notes to Chapter 5

1. The recent study of Lawson (1982) which uses annual data mixes together slippage and the wage norm and does not allow for the overlapping of periods with different wage norms within the year.

2. Subsequent econometric analysis showed that the omission of these periods did not affect the coefficients of the estimated wage equation.

3. Whilst it might be tempting to interpret any discrepancy between the wage rates and earnings series as reflecting wage drift this inference cannot be made, see Appendix D.

4. The main difference between the basic weekly wage rates series and the Aberdeen series is that the former is base weighted whilst the latter is current weighted (see Elliott and Dean, 1978, for further discussion).

5. About 2 per cent of the increase in the Aberdeen settlement index can be attributed to staged settlements however (Elliott and Shelton, 1978).

6. An annual model pre-supposes a labour force settling at fixed yearly intervals.

CHAPTER 6 ESTIMATES OF INCOMES POLICY FROM A REAL WAGE MODEL

6.1 The appropriate measure of wages

A general formulation whereby a measure of incomes policy could be included in a real wage model was set out in Chapter 3. However, there remain two major issues to be resolved which have plagued previous work on the estimation of wage equations. The first of these concerns the appropriate measure of wages and the second concerns the appropriate form of differencing in the wage variable (i.e. whether $\Delta \log W_t$ is defined as $\log(W_t/W_{t-1})$ or $\log(W_t/W_{t-4})$. These issues are to some extent related.

The extent of the difference in the experience of wage growth under alternative measures of wages has already been discussed in Chapter 5. The main distinction lies between variables which purport to explain changes in the level of earnings per head and in the total wage bill, on the one hand, and those which attempt to measure the change in wage rates. Whilst some interest may be placed on the issue of whether incomes policy more successfully affects nationally negotiated wage rates rather than total earnings (which includes the effects of overtime and shift payments, local bargaining etc.) the existing data are not capable of resolving this issue. As Appendix D shows, earnings and rates data are not available on a comparable basis which covers the whole economy. Basic wage rate data typically relate only to manual workers who only cover just over one-half of those in employment (Whitley et al., 1980, p.123) and therefore the data are not capable of drawing any conclusions about the overall national effects of any given policy. In addition, basic wage rates can, and are often, heavily influenced by the negotiations of major sectors of the economy (such as engineering) where the settlement only defines a minimum level or floor to earnings and does not reflect any change in the pace of wage settlements. This objection is recognised by both Elliott and Shelton (1978) and by Coutts, Tarling and Wilkinson (1976) who construct wage rate indices which avoid some of these problems. However, such indices cannot incorporate the growing influence of local negotiations and they only measure, in any case, the manual sector of the economy. [1]

Thus, whilst the various settlement indices are in some sense an improvement on the basic wage rates data and they may be able to answer useful questions about the influence of policy at the more microeconomic level they require some heroic assumptions in order to derive conclusions about policy at the aggregate level. Chapter 3 argues that, from a modelling point of view, the change in the overall pay bill is a more relevant measure of wages and for this reason changes in the average level of wages and salaries is the preferred measure. This is a comprehensive measure which includes all employees and all sources of pay. From the point of view of macroeconomic policy it is the most relevant variable when considering the impact of incomes policy on inflation since it is total wage costs which help to determine the level of prices.

The average wage data combine two separate influences as the absolute change in the wage bill can be defined as the change in earnings per head and the change in the numbers receiving increases. Thus

$$\Delta W_t = \sum_{i=1}^{m} \theta_{i,t} \; \Delta WS_{i,t} \qquad (6.1)$$

where ΔWS refers to the absolute increase in pay from those receiving a settlement within the period and $\theta_{i,t}$ reflects the numbers affected in each period. Absolute changes in the index can therefore be expressed as a weighted sum of solely those people settling within the particular period. But proportional changes in the wage level will depend not only on the number settling during the period but also the previous level of wages of all groups, including those who do not settle within the period.

If wage settlements were spread at uniform and constant periods throughout the year an index based on (6.1) would provide a reasonably accurate guide to movements in the average size of settlements.[2] However, the very presence of incomes policy and its rules on settlements ensure that this does not happen. This has led various authors (for example, Johnston and Timbrell, 1973 and Ashenfelter and Pencavel, 1975) to adjust the wage equation for variations in the number of workers settling in each period. Johnston and Timbrell add this variable to the basic equation whilst Ashenfelter and Pencavel use it to deflate the dependent variable.

Both Johnston and Timbrell and Ashenfelter and Pencavel use manual workers settling in each period. In order to measure θ as an index Ashenfelter and Pencavel deflate by the total number of employees (both manual and non-manual). This will clearly impart a falling trend to the resultant series (ϕ) since the number of non-manual employees has grown far more rapidly than the number of manual employees since 1960 (Whitley *et al.* 1980 p.115).

The procedure adopted by Ashenfelter and Pencavel assumes that contract length is fixed and evidence presented by Tarling and Wilkinson (1977) suggests that this may not be valid.[3]

However, whilst contract lengths may not be completely rigid, there is a certain stickiness in wage bargaining so that changes in ϕ will still represent institutional factors such as the customary timing of settlements of different size groups.[4] Therefore, whilst one might expect ϕ not to be dominated by purely economic factors (and this is the conclusion of Johnston and Timbrell, 1973, amongst others) the very presence of incomes policy will have an important influence. Evidence on contract length from the Aberdeen database finds some support for the idea that contract length is reduced in times of rapid inflation but no conclusive evidence to draw inferences regarding the role of incomes policy on contract duration.[5] For example, a wage freeze might be expected to substantially reduce the level of wage settlements. To deflate the wage variable by the proportion of workers settling in a given period would clearly be an inappropriate way to measure the influence of incomes policy since the main aim of policy is to reduce the rate of growth of the wage bill regardless of whether this comes from a reduction in the size of average settlement or the number of settlements.[6] In Chapter 5 the influence of policy rules on the timing of settlements was discussed and this influence would be increased by any anticipation or catch-up effects. In principle, incomes policies which involve a twelve-month rule for settlements should also affect the timing of settlements but if such a rule follows a period of freeze then the rule may not have such an effect since the freeze would have already extended the length of contract.[7] Tarling and Wilkinson (1977) using data on national negotiations for manual workers show that 1970 represented a watershed in bargaining behaviour with a consistently higher proportion of bargaining groups settling in each year and with a near 100 per cent settlement rate since 1974. This might be explained by the institutionalisation of the 12-month rule by the fact that price and wage inflation was significantly higher after 1970 and under these circumstances one might expect groups to settle more rapidly than otherwise.[8]

The preferred approach to this question is to isolate the normal (if there are any) institutional patterns in wage settlements from the total as deferred settlements, anticipation and catch-up effects can be dealt with explicitly within the equation.

The issue regarding the differencing of the wage variable is also related to the timing of settlements. Rowley and Wilton (1973) set out a model where wages are set annually for all workers and then fixed until the next annual settlement and the relative change in the wage rate over its value four quarters earlier is given by a moving average of the importance of the groups settling within each quarterly period. On the assumption that these weights are equal the model then induces a fourth-order moving average serial correlation process which results in biased estimates of the standard errors.

Returning to (6.1) we have $\Delta \log W_t = \phi_t \, \Delta \log WS_t$

if $\Delta \log WS_t = \alpha + \beta X_t + \varepsilon_t$ (6.2)

then Ashenfelter and Pencavel (1975) show that:

$$\Delta \log W_t = \alpha\phi_t + \beta\phi_t X_t + v_t \qquad (6.3)$$

where $v_t = \phi_t \varepsilon_t$. The disturbance term therefore depends systematically on ϕ.

They go on to show that for:

$$\log W_t - \log W_{t-4} = \alpha + \beta \sum_{i=0}^{3} \phi_{t-i} X_{t-i} + \sum_{i=0}^{3} v_{t-i} \qquad (6.3)$$

and $\phi_t = \frac{1}{4}$ for all periods; i.e. workers settle evenly throughout the year then:

$$\log W_t - \log W_{t-4} = \alpha + \beta \sum_{i=0}^{3} \tfrac{1}{4} X_{t-i} + \sum_{i=0}^{3} v_{t-i} \qquad (6.4)$$

$$= \alpha + \tfrac{1}{4} \beta \sum_{i=0}^{3} X_{t-i} + Z_t$$

Ashenfelter and Pencavel then argue that there is no reason why (6.3) should not be fitted directly. However, the same objections as outlined earlier remain. The major question is whether the lags on the price and real wage variables should be 1 quarter or 4 quarters. If we were dealing with a group of workers settling at period t, having previously settled in t-4, then the four-quarter lag might seem the more appropriate. However, the logic of the real wage catch-up implies that it is the current size of the real wage gap that is relevant not the gap at the time of the last settlement. Therefore the real wage lagged one quarter is the correct variable. In terms of the real wage model there is no additional role for price inflation since this is already incorporated in the real wage catch up. Therefore its role must relate more to expected inflation.

In earlier versions of the model the specification used was largely that of equation (3.12) ; i.e.

$$\dot{w}_t = b_0 (1-k) + b_1 (1-k) u_t + b_2 (1-k)\dot{p}_t$$

$$+ b_3 (1-k) (r.w/p)_{t-1} + b_4 (1-k)T + k\gamma IP_t + \eta_t$$

but including also the term $\dot{w}_{t-1}$. The rationale for this term was that it reflected the influence of settlements made by other workers in the previous period. A term in the proportion of workers settling might be included on the right hand side of the equation. However, when the settlements term is decomposed into non-seasonal and seasonal elements (using seasonal dummies to represent the seasonal elements) it is the latter which provide all of the statistical explanation [9] Therefore it is clear that the proportion of settlements is not a useful addition to the equation, rather it is the seasonal factors reflecting regular changes in the proportion of workers settling in each period which helps to explain variations in the rate of wage inflation.

6.2 Anticipation and catch-up effects

Previous chapters have emphasised the importance of allowing as far as possible for timing effects relating to policy. In Chapter 5 specific allowance is made within the incomes policy variable for the effects of incomes policy rules in switching wage settlements. Here we deal with more general anticipation and catch-up effects.

Anticipation effects can be of two main types. First, the fact that incomes policies are sometimes announced in advance of their starting date may provide an incentive for workers to correspondingly advance their wage negotiations. Second, there may be no pre-announcement but expectations of changes in policy stance may be formed with a similar incentive to the first case.

If the period between announcement or expectation of a policy change and the actual occurrence of a policy change is brief then the scope for advancing wage negotiations will be limited especially if workers are constrained by a settlement interval which is not markedly flexible.[10] The incentive to advance negotiations will also depend on the actual (or expected) change in the pressure of policy. Similar arguments apply in reverse to the ending or relaxation of policy where an announcement or general expectation of easing of policy may encourage a postponement of wage settlements. Even if the period of prior knowledge or expectation is fairly short it is unlikely that speeding up or postponement of claims will extend over more than one quarter for the reasons outlined above. In the case of pre-announced changes in policy the effect of the change in the timing of settlements will therefore depend on the extent of the change in policy and the expected proportion of claims normally settled in the preceding period. Thus the appropriate variable, IPA, is given by:

$$IPA_t = \lambda^*_t \cdot (-\Delta IP4_{t+1}) \qquad (6.3)$$

where λ^*_t is the expected proportion of settlements occuring in period t in absence of any policy change and $\Delta IP4_{t+1}$ is the actual change in policy pressure in the following period.
Since this is purely a timing change we would expect the effect to be reversed in following periods so that:

$$\sum_{i=1}^{n} IPA_{t+i} = - IPA_t \qquad (6.4)$$

Complications arise when the lag between announcement and commencement is less than one quarter. The announcement effect can then be defined more generally as:

$$IPA_{t+i} = \lambda^*_{t+i} \; Q_{t+i} \quad (-\Delta\, IP4_{t+1}) \qquad (6.5)$$

for $t = 0,1$

where Q reflects the proportion of the quarter during which announcement effects exist. Thus announcement effects can occur within the current quarter alongside the offsetting effects emerging from (6.4). The logic behind postponement of settlements due to announcement effects is exactly analogous to that described before.

The logic behind the allowance for expectations effects of incomes policy and general catch-up effects is somewhat different. Although the timing considerations outlined above still apply the model for expectational effects should be specified in terms of the expected rather than the actual change in policies. The determinants of this variable are therefore related to those underlying the authorities' decision to impose policy (see Chapters 7 and 8) and are discussed more fully under the general heading of expectations in section 6.4. In terms of equation (6.5) the expectational effect of incomes policy now becomes

$$IPA^e_t = \lambda^*_t \, (-\Delta\, IP4^e_{t+1}) \qquad (6.6)$$

λ^*_t is the given institutional constant and $\Delta\, IP4^e_{t+1}$ is the expected change in policy pressure in the following period. Again, as the issue is one of timing $\sum_{i=1}^{n} IPA^e_{t+1} = -IPA^e_t$

Table 6.1 Incomes Policy Announcements

Policy	Quarters affected	Increase or decrease in policy pressure	value of λ*	value of Q
Guiding Light	1962(1)	increase	0.244	0.67
Guiding Light	1963(3)	decrease	0.271	1.0
Standstill	1966(3)	increase	0.224	0.33
Moderate restraint	1968(2)	decrease	0.271	1.0
Freeze	1972(4)	increase	0.260	0.33
Stage 3	1974(1)	decrease	0.244	0.33
Phase 1	1975(3)	increase	0.224	0.33
Phase 4	1979(2)	decrease	0.271	0.67

Notes: * is the median value of the proportion of workers settling in the appropriate quarter of each year; it is derived from the proportion of workers recorded as having made settlements in each period, excluding settlements relating to the engineering sector. The data only covers manual workers and is scaled so that on average the annual proportion settling is unity. Source: Department of Employment Gazette (various).

Q is the proportion of the month for which announcements were current.

In earlier chapters it was argued that the real wage resistance formulation of the wage equation already allows for some automatic catch up resulting from any pressure on real wages. However, there may be some extra effects in which case the sign on the catch-up variable will be positive <u>or</u> alternatively incomes policy may actually defuse some of the desire to regain the previous trend in real wages so that it is conceivable that any catch-up variable has a negative coefficient. In either case the extent of potential catch-up would depend on the real wage effects of the policy so that a distribution of the lagged terms in the incomes policy variable itself would be appropriate. However, a less symmetric formulation would be more plausible as the probability of catch up will be higher, <u>a priori</u>, as policy pressure eases rather than when it tightens.

Thus we can also define policy catch-up as only occurring following an easing of policy (i.e. when $\Delta IP > 0$) where IP is the measure of policy pressure. The institutional considerations discussed earlier suggest that a significant easing of policy is unlikely to be followed by a major explosion of settlements but rather by a steady catch-up reflecting the normal distribution of wage settlements over time. Therefore catch-up is best measured as a set of lagged variables which incorporate λ^*_t defined thus:

$$CATCH_t = \Delta IP * \lambda^*_t$$
$$CATCH_{t+1} = \Delta IP_{t-1} * \lambda^*_{t+1}$$
$$CATCH_{t+2} = \Delta IP_{t-2} * \lambda^*_{t+2}$$
$$CATCH_{t+3} = \Delta IP_{t-3} * \lambda^*_{t+3}$$

where CATCH are the policy catch up effects and where ΔIP_t is the change in the incomes policy variable, defined as ΔIP for $\Delta IP > 0$ and $\Delta IP = 0$ otherwise.

A modification of this specific catch up approach would be to measure ΔIP as the cumulative policy pressure over the last two years (say) so that ΔIP is now defined as $\sum_{i=1}^{n} IP_{t-i}$ for $\Delta IP_t > 0$ and $\Delta IP_t = 0$ otherwise.

The sign on the catch-up variable is not unambiguous. Whilst it may be thought that the catch-up variable should be positively signed so that wages are higher after the ending of a severe phase of policy the real wage resistance formulation implies that any pressure on real wages is compensated automatically so that the catch-up variable measures a path of real wages after a restrictive policy phase which is different from pressure to regain the trend level of real wages. Thus if policy succeeds in reducing the trend rate of real wage growth or in reducing the pressure to regain real wages in any other way the sign of the catch-up variable may be negatively signed.

6.3 Estimation of the wage model

The form of the real wage equation incorporating incomes policy effects described in Chapter 3 was of the form:

$$\Delta \log W = b_0\,(1-k_t) + b_1\,(1-k_t)\log U_t + b_2\,(1-k_t)\Delta \log P_t$$

$$+ b_3\,(1-k_t)\,\log(r.W/P)_{t-1} + b_4\,(1-k_t)TIME + k_t \log(1+IP1_{t/100}) \quad (6.7)$$

where $k_t = \gamma\, IPS_t$

This model is termed the restricted model of policy. First we consider the unrestricted form (6.8).

$$\Delta \log W = b_0' + b_1' \log U_t + b_2' \Delta \log P^e_t + b_3' \log(r.W/P)_{t-1} + b_4' \text{ TIME} + b_5' \text{ IP}_t \qquad (6.8)$$

where IP_t is the overall index of incomes policy. Here incomes policy enters the wage model as an additional explanatory variable instead of transforming the whole equation. This provides an interim step between the traditional dummy variable approach and the more comprehensive approach represented by equation 6.7.

A more general starting point for estimation of 6.8 is one which allows for richer dynamic properties, following the work of Hendry and Mizon (1978), might be of the form:

$$\Delta \log W = \alpha_0 + \sum_{i=0}^{m} \beta_i \log U_{t-i} + \sum_{j=o}^{n} \theta_j \Delta \log r_{t-j} + \sum_{k=1}^{p} \delta_k \Delta \log W_{t-k} + \phi_1 \log(\ W/P)_{t-1} + \phi_2 \log P_{t-1} + \phi_3 \Delta \log P^e_t + \phi_4 \text{TIME} + \phi_5 \log IP_t + \varepsilon_t \qquad (6.9)$$

Definitions of the data are given in Appendix B . All data are seasonally unadjusted so that the only prior smoothing that occurs is in the alternative version of the real wage gap variable (LPGAP).

Estimation is over the period 1963 (Q2) quarterly through to 1979(Q4). This allows for the construction of lagged variables and for extra-sample period tests of the forecasting ability of the equations.

The estimation methods used are ordinary least squares (OLS), generalised least squares (GLS), recursive least squares (RLS), instrumental variables (IV), and three-stage least squares (3SLS). The main statistical packages used are the TSP package (Time Series Processing), GIVE (Generalised Instrumental Variable Estimation).[11]

The first section of the chapter discusses the results from applying OLS and GLS to the unrestricted wage model. These methods assume that all the right hand side variables in the wage equation are exogenous. If in fact some of the right hand side variables in the wage equation are really endogenous (such as prices and the incomes policy variable) then the application of OLS will lead to biased and inconsistent parameter estimates (Stewart and Wallis, 1981). However Maddala (1977, p.231) argues that the OLS method is more robust against specification errors than many of the simultaneous equation methods and that it is fruitful to report OLS estimates of the structural equations along with those from other methods which give consistent estimates. It is in this spirit that questions of stability and dynamic structures are considered as well as contrasting alternative measures of the pressure of demand for labour, the incomes policy variable and the real wage gap. The next section considers some of the biases arising from OLS estimation by re-estimating the unrestricted model by IV, treating both the price and incomes policy variables as endogenous.

Following this the restricted version of the model is estimated by both OLS and IV and the results compared with those of the unrestricted form. Results are also presented for joint estimation of the wage equation and a price equation although full endogeneity with policy is treated in Chapter 9. The chapter concludes with a discussion of the role of expectations in the wage model but some of the empirical issues raised are deferred until Chapter 9.

6.3.1 The unrestricted model

Starting off with the more general dynamic formulation the estimation results show that (6.8) is a reasonable representation of the dynamic structure. The presence of the lagged real wage term does itself provide a form of error correction mechanism.

The equation results using OLS are shown in table 6.2. for comparative purposes the table shows the results of estimating the wage equation with a set of zero:one policy dummies and also the results of estimating (6.8) with no policy variable at all. At an early stage equations were estimated using alternative measures for the pressure of demand and for the real wage gap. In the first place the unemployment term was replaced by the change in output (GDP) and the lagged level of output but non-nested hypothesis tests such as the Cox-Pesaran-Deaton test, the J test and the P test (see Davidson and Mackinnon, 1982) support the version of the equation with a solitary lagged unemployment variable. Other measures, such as vacancies or unemployment minus vacancies also proved less satisfactory. Some authors (e.g Minford, 1980) have argued that an important factor in the labour supply decision is the wage replacement ratio (measured as the ratio of unemployment benefit to the average wage). Previous work by Whitley (1980) has

Table 6.2 Single-Equation Estimates of the Wage Equation

Dependent variable is ΔlogW. Estimation 1963(Q2) - 1979(Q4) by OLS

Equation	b_0	b_1	b_2	b_3	b_4	b_5	b_6	b_7	b_8	b_9	RSS	$\bar{R}^2$	$\chi^2_{(4)}$	RHO	$\chi^2_{(8)}$
(1)	0.2441 (1.4)	-0.0386* (-1.9)	0.0125 (0.1)	-0.4437** (-4.7)	0.0016** (2.0)		0.3723** (3.9)				0.01516	0.508	..	0.5055** (4.7)	..
(2)	0.3048* (1.7)	-0.0504** (-2.4)	0.0218 (0.1)	-0.4625** (-4.5)	0.0020** (2.4)		0.3816** (3.7)				0.01288	0.476	..	0.4224** (3.8)	..
(3)	0.0755 (0.7)	-0.0173* (-1.6)	0.1479 (0.7)	-0.2700** (-2.6)	0.00087* (1.9)	IP4: 0.2769** (2.8)	0.2697** (2.6)				0.01567	0.479	3.2	..	13.1
(4)	1.0375** (5.7)	-0.0405 (-1.5)	0.2510 (1.2)	-0.7954** (-7.1)	0.0049** (4.3)	0.4558** (2.5)					0.01629	0.471	3.67	0.861** (10.9)	7.3
(5)	0.0753 (0.7)	-0.0203* (-1.7)	0.0962 (0.4)	-0.2351** (-2.2)	0.0009* (1.8)	IP1: 0.1366** (2.3)	0.2468** (2.3)				0.0163	0.457	..	..	..
(6)	0.0265 (0.2)	-0.0218* (-1.8)	0.0630 (0.3)	-0.2079** (-2.0)	0.0006 (1.3)	IP2: 0.1289** (2.2)	0.2757** (2.4)				0.0164	0.453	..	..	..
(7)	0.0651 (0.6)	-0.0191* (-1.6)	0.0395 (0.4)	-0.2515** (-2.4)	0.0009** (1.9)	IP3: 0.2907** (2.9)	0.2666** (2.5)				0.0155	0.485	..	..	..
(8)	0.0573 (0.5)	-0.0187* (-1.7)	0.0733 (0.3)	-0.2365** (-2.3)	0.00082* (1.8)	IP5: 0.2144** (2.6)	0.2576** (2.5)				0.0160	0.471	..	..	..
(9)	1.0037** (5.6)	-0.0384 (-1.4)	0.2759 (1.3)	-0.7728** (-6.9)	0.0047** (4.4)	IP4: 0.5414** (2.8)		2.6469 (1.3)			0.01583	0.468	3.4	0.8477** (10.2)	8.8
(10)	0.1161 (1.1)	-0.0137 (-1.3)	0.0429 (0.2)	-0.4728** (-3.1)	0.0009** (2.1)	0.3275** (3.1)	0.4234** (2.9)	1.2194 (0.6)		0.3344* (1.7)	0.01460	0.500	4.0	..	13.8
(11)	0.1038 (1.0)	-0.0147 (-1.3)	0.2896 (1.3)	-0.2791** (-2.7)	0.0008* (1.8)	0.3389** (3.1)	0.2476** (2.4)	2.6336 (1.3)	1.7824* (1.6)		0.01475	0.495	2.9	..	12.9
(12)	0.1238 (1.2)	-0.0120 (-1.1)	0.1248 (0.5)	-0.5127** (-3.4)	0.0008* (1.8)	0.3459** (3.3)	0.4566** (3.2)	1.9507 (1.0)	2.1170* (1.9)	0.3870** (2.0)	0.01369	0.523	3.7	..	12.8
(13)	0.0719 (0.7)	-0.0108 (-1.0)	0.0533 (0.2)	-0.5373** (-3.5)	0.00062 (1.3)	0.6854** (3.5)	0.5245** (3.5)	2.7244 (1.3)	$IP4_{t-1}$: -0.3974** (-2.2)	0.4014** (2.1)	0.01341	0.532	..	..	..

The equation is: $\Delta\log W = b_0 + b_1\log(U_{t-1}) + b_2\Delta\log P_t + b_3\log(r.W/P)_{t-1} + b_4 TIME$

$+ b_5\log(1+IPi/100) + b_6\log(r.W/P)_{t-2} + b_7\log(1 + IPA/100)$

$- b_7(\log(1 + IPA/100)_{t-1} + b_8\log(1 + CATCH/100) + b_9\Delta\log W_{t-1}$

+ seasonal dummies. For seasonal dummies and policy dummies see Appendix E.

found no role for such a variable and has argued that some of the significant results found in the literature arise from measuring the hypothetical entitlement of a selected so-called representative of the working population rather than the actual average ratio. The statistical representations of these series differs considerably with the actual average replacement ratio rising sharply in 1966 following the introduction of earnings-related supplement but then remaining steady and declining through the 1970s.

The alternative measure of the real wage gap variable was described in Chapter 3. It represents a variant of the real wage resistance hypothesis, replacing the exogenous time trend by a moving average of past real wages. However, the non-nested hypothesis tests described earlier found no support for this version of the hypothesis over the standard formulation. Another alternative version tried was the inclusion of a term in the change in the terms of trade to test the hypothesis that real wage resistance did not apply when the cause of a fall in real wages was external rather than internal. However, this variable always proved statistically insignificant at the 5 per cent level.

The policy variables were all broadly significant whether the pure 'wage pressure' version was used (IP1) or the version using the degree of sanctions and trade union resistance (IP4). The estimated equation could not reject the hypothesis that the coefficients on IP1 and (IP4-IP1) were equal, although IP4 was generally more statistically significant than IP1. This implies that both the real wage pressure and the goverment stringency and trade union response variables have an important role to play.

Analysis of the correlation structure of the residuals reveals an absence of fourth order serial correlation but significant first order serial correlation. The unrestricted form of the equation suggested the inclusion of an additional lagged real wage variable and also the lagged dependent variable. Equation (1) of Table 6.2. shows the wage equation with no policy influences. All variables except for the constant term and the price variable are significantly different from zero and there is significant first order serial correlation of the residuals. Inclusion of policy dummies improves the overall performance of the model and the unemployment term increases in significance but there is no noticeable effect on the estimates of the parameter values. This result is not surprising since only one policy dummy is significant - that relating to the period of policy for 1973-4 .[12] Values of the policy dummies are given in Appendix E.

Including the most comprehensive incomes policy measure (IP4) in equation (3) provides an equation which has a very similar coefficient of determination ($\bar{R}^2$) to the policy dummy equation (2). All the variables have the expected signs. The policy variable itself is significant whilst the coefficient on the unemployment variable is only marginally so. The estimates of the coefficients on unemployment and lagged real wages are now considerably lower than for (2) but that on prices is higher (though still not statistically significant). The absolute size of the two lagged real wage coefficients is almost identical and the null hypothesis that they are equal cannot be rejected at the conventional level of significance. If these coefficients are equal <u>and</u> the coefficient on the price variable is zero then the equilibrium real wage implied by the equation is indeterminate. The presence of the additional lagged term in real wage implies an oscillatory pattern for the lagged adjustment to desired real wages. Equation (4) re-estimates (3) by dropping the term in real wages lagged by two-quarters and instead incorporating a first order autocorrelation process. As (3) is a restricted autoregressive form and as the autoregressive parameter attached to (3) is insignificant we can reject (4) in favour of (3). The coefficient on the incomes policy measure is somewhat higher than in (8) whilst the coefficient on lagged real wages suggests a fairly rapid adjustment to desired real wages. The combination of the estimates b_3 and b_4 implies a desired trend rate of growth of real wages of 2.5 per cent per annum.

Contrasts between the alternative measures of policy IP1, IP2, IP3, IP4, and IP5 are given by equations (5),(6),(7),(3) and (8) respectively. The measure IP1 is the pure real wage pressure variable; IP2 adjusts IP1 for the trend rate of real wage growth; IP3 adjusts IP1 for Government stringency and IP4 is equivalent to IP3 adjusted for trade union response. IP5 is a comparable measure to IP4 but using the quantitative index of strikes as a measure of trade union response instead of the subjective index TPS. Each policy measure is significant with equations containing the measures IP3 and IP4 providing the best overall statistical performance.

Since $IP4_t = (\dot{wn}_t - \dot{p}_{t-1}).\ IPS_t$ or $IP4_t = IP1_t\ .\ IPS_t$

and $IPS_t = 0.5\ (GPS_t + TPS_t)$

where TPS_t is measured on a scale of increasing intensity then:

$$IP4_t = 0.5(\dot{wn}_t - \dot{p}_{t-1}).(GPS_t + TPS_t).$$

The results suggest that IP1 and IPS both contribute to the measurement of policy influence. Similarly we can further break down IPS into its two components; the government factor (GPS) and trade union response (TPS). Again we cannot reject the null hypothesis that their coefficients are equal although since the coefficient on TPS is in fact statistically insignificant this is a weak result. A similar result holds when the strike variable is used instead of TPS.

Equation (9) is a version of equation (4) with the introduction of the anticipation variable. We cannot reject the hypothesis that the coefficient on the variable in t-1 is equal to minus the coefficient in period t. Therefore the prior announcement effect is purely one of timing so that the effect on wage inflation in quarter t is exactly offset in period t+1. The coefficient b_7 is positive but not quite significant. It is reduced when lagged wage inflation and the real wages lagged by two periods are included as additional explanatory variables (10). First order serial correlation then ceases to exist.[13]

Equations (11) and (12) include a policy-catch up variable which relates potential policy catch up to occasions when Δ IP4 is positive (see p.6.11). This variable is marginally significant in equation (11) and more so in equation (12). Additional lagged terms in the catch-up variable and the use of an Almon polynominal distributed lag failed to find any further effect of catch up. The coefficients on the catch-up variable imply an additional positive effect on wage inflation. An alternative measure of catch up is merely the lagged value of the policy variable. This proves highly significant and has a negative sign implying that a previous tight policy will be reflected in higher wage inflation in the current quarter. However, since in equation (13) $b_5 > b_8$ the persistence of incomes policy lowers wage inflation. Alternative specifications which included the cumulative effect of past policy proved unsuccessful.

Tests of the forecasting ability of the equations over the four quarters following the end of the estimation period reveal reasonably good predictive performance.

Using a recursive estimation package [14] shows a basically stable structure for equation (11). This is achieved by computing the standard least squares parameter estimates recursively giving:

$$\beta_{t+1} = \beta_t + \theta_t v_t$$

where β_t is the estimate based on the first t observations, θ_t is the gain and v_t is the innovation or one step ahead forecast error. The t-test for zero innovation mean is equal to 0.5 well below the critical value and the Box-Pierce Portmanteau test statistic (to check on residual autocorrelation of the innovations) is 6.7 (against a critical level of 21.0). Examination of the innovations reveal two main outliers, in 1973 Q2 and in 1975 Q2.

In Table 6.3 the results of using instrumental variables to estimate the wage equations are shown. Both price inflation and the incomes policy measure are taken to be endogenous and the instruments used are lagged values of the endogenous and exogenous variables together with current and lagged values of foreign prices. Estimation of the equations by OLS which ignore simultaneous equation bias can result in biased and inconsistent parameter estimates since some of the independent variables may be correlated with the error term. Use of lagged endogenous variables as instruments is only valid when there is no first-order serial correlation of the residuals since the instruments used are only valid if they themselves are independent of the error term.

Table 6.3 **Estimation of Unrestricted Model using Simultaneous Equation Methods**

Equation	b_0	b_1	b_2	b_3	b_4	b_5	b_7	b_8	RSS	$\bar{R}^2$	D.W.	$\chi^2_{(4)}$	$\chi^2_{(8)}$
(14)	0.2785** (2.0)	-0.0093 (-0.7)	1.1525** (2.1)	-0.1918* (-1.6)	0.00098* (1.8)	0.3072** (2.3)	0.3072 (0.3)	2.1316 (1.5)	0.0210	0.294	2.06		
(15)	0.2505** (2.3)	-0.0113 (-1.0)	1.0†	-0.1607** (-2.3)	0.000950* (1.9)	0.2603** (2.4)	0.8958 (0.5)	2.0210* (1.6)				3.1	8.9
			b_2'										
(16)	0.1839* (1.8)	-0.0082 (-0.6)	0.2373** (2.2)	-0.1126 (-1.4)	0.00070 (1.4)	0.3129** (2.5)	4.3550** (2.0)	1.7555 (1.5)	0.0159	0.465	2.24		
			b_2										
(17)	0.2486** (2.8)	-0.0121 (-1.3)	0.9213** (4.7)	-0.15625** (-2.5)	0.000957** (2.4)	0.2021** (2.3)	2.0467 (1.4)	1.3215 (1.3)	0.0194	0.348	1.96		
(18)	0.2591** (3.1)	-0.0111 (-1.2)	1.0†	-0.1678** (-2.9)	0.000949** (2.3)	0.2065** (2.4)	1.9899 (1.4)	1.3566 (1.4)	0.0200	0.327	1.95		

Notes: The basic equation is described in Table 6.2; for seasonal dummies see Appendix E.

b_2' is the coefficient on expected prices

Equations (14) - (16) are estimated by the method of instrumental variables using lagged values of the endogenous and exogenous variables plus current and lagged values of foreign prices as instruments

For equation (15) the χ^2_9 test of the independence of the instruments and the error term = 13.1 with a critical value of 19.1.

Equations (17) and (18) are estimated as seemingly unrelated regressions of the wage equation and a price equation of the form $P = C_0 + C_1WC + C_2TAX + C_3PM + C_4\ P\text{-}1$ + seasonal dummies, where WC refers to unit wage costs; TAX to unit taxes and PM to import prices.

Estimates of the coefficients are:

for (17) $C_0 = -1.5988^{**}$ (-5.5) $C_1 = 39.497^{**}$ (9.8) $C_2 = 32.518^{**}$ (3.7) $C_3 = 0.0975^{**}$ (4.2) $C_4 = 0.6738^{**}$ (17.9)
SE = 1.1% D.W. = 1.87 Durbin 'h' test = 0.54

for (18) $C_0 = -1.5902^{**}$ (-5.4) $C_1 = 39.308^{**}$ (10.0) $C_2 = 32.027^{**}$ (3.8) $C_3 = 0.0978^{**}$ (4.2) $C_4 = 0.6771^{**}$ (18.6)
SE = 1.1: D.W. = 1.88 Durbin 'h' test = 0.53

Under IV Estimation the terms in real wages lagged by two periods and in lagged wage growth are now no longer significant. In contrast with equation (12) the price coefficient now becomes significant and much larger in absolute value. The coefficient on the incomes policy variable also increases as does that on the announcement variable. The latter and the catch-up variables are now statistically significant at the 5 per cent level.

Table 6.3 also reports the results of using an alternative measure of price expectations. Equation (16) uses the forecast growth in consumer prices as forecast in successive issues of the National Institute Economic Review. This is a genuine ex-ante measure of expectations but not necessarily a rational expectations measure. The measure of expected prices is taken to be endogenous in the same way as the standard measure of price inflation used. Overall the equation performs better than the comparable equation with actual inflation and the price expectations coefficient is significant but much smaller in magnitude than the estimates obtained from equations (14) and (15). The policy variable remains significant but both lagged real wages and the time trend become insignificant. The catch up variable is now significant and much larger in magnitude.

Equation (15) restricts the price coefficient to unity, a restriction which is justified by the data (using standard 'F' tests). The coefficients on lagged real wages and the time trend imply a quarterly rate of adjustment of real wages to its desired value of 16 per cent per quarter and a long run growth of desired real wages of almost 2.4 per cent per annum (very close to the observed trend rate of growth over the period). The announcement variable is insignificant but that on the catch-up term is marginally significant. In equations (14) to (16) both prices and the incomes policy term are treated as endogenous. The chi-squared test of the validity of the chosen instruments cannot reject the null hypothesis that they are independent of the error term. Tests of the forecasting ability of the model cannot reject the hypothesis of stability and there is no sign of serial correlation of the residuals judging from the Box-Pierce Portmanteau statistic of joint autocorrelation, although Stewart and Wallis (1981) argue that this is a weak test.

Equations (17) and (18) are estimated using the method of estimating seemingly unrelated regressions (Maddala, 1977, p.465) which allows for contemporaneous correlation between the residuals of different equations. Here the relevant wage equation is jointly estimated with a price equation of the cost mark-up variety [15]. In this instance we allow for the possibility that the errors in the wage and price equations may be due to a common cause. The coefficients of equation (18) obtained are very similar to those of equation (15), the main difference being the lower point estimate of the coefficient on the policy variable.

The price equation itself is reasonably well supported by the data with all coefficients highly significant. The price equation contains a lagged dependent variable (to capture lags in price formation) and consequently the Durbin-Watson statistic is biased towards acceptance of the null hypothesis of zero first order serial correlation. An alternative test is the Durbin 'h' statistic and this confirms the lack of first-order serial correlation of the residuals.

6.3.2 The Restricted Model

Table 6.4 shows the results of estimating equations based on model 6.7. Because of the restrictions on the parameters the model was estimated using the non-linear least squares routine of TSP. In equation (19) the model is estimated on the assumption that all right hand side variables are predetermined whereas equation (20) treats the price and incomes policy variables as endogenous and uses instruments for these variables. The overall model does not perform quite as well statistically as the unrestricted model (e.g equation(11)) but we now find that the additional lagged term in real wages needed for (11) is no longer required. The coefficient on the policy variable is smaller in size than the estimate of the unrestricted model and is less significant. For equation (19) the term in lagged real wages and the time trend are no longer significant whereas the coefficient on the unemploymnet variable is. In this equation neither the announcement nor catch-up variable is significant. The Durbin-Watson test suggests little likelihood of first order serial correlation. However, the discussion in chapter 3 suggests a likelihood of heteroskedasticity.

One test for the presence of heteroskodasticity is the Glejser test (see Stewart and Wallis, 1981,p.250) [16]. The test cannot reject the null hypothesis of the absence of heteroskedasticity although one possible problem with the test is that the error in the second stage equation is likely to be heteroskedastic itself. [17]

When the restricted equation is estimated by the method of instrumental variables, treating both prices and policy as

Table 6.4 Estimates of the Restricted Model

Equation is of the form: $\Delta \log W = E_0(1-\gamma IPS_t) + E_1(1-\gamma IPS_t)\log U_{t-1} + E_2(1-\gamma IPS_t)\log({}^{rW}/p)_{t-1} + E_3(1-\gamma IPS_t)\Delta \log P + E_4(1-\gamma IPS_t)TIME + \gamma IPS_t \log(1 + {}^{IPI}t/100)$

$+ E_6\ DLPA + E_7 \log(1 + {}^{CATCH}/100)$ + seasonal dummies

Equation	Method of Estimation	E_0	E_1	E_2	E_3	E_4	γ	E_6	E_7	Glejser test	RSS	$\bar{R}^2$	DW
(19)	OLS(restrictions imposed)	0.1713 (1.5)	-0.0238* (-1.9)	-0.0522 (-0.6)	0.3099 (1.2)	0.00107** (2.0)	0.1302* (1.9)	2.1227 (1.2)	1.4617 (1.2)	t = 0.50	0.01689	0.432	2.02
(20)	IV (restrictions imposed)	0.2904* (1.9)	-0.0153 (-1.1)	-0.1741 (-1.4)	1.1158* (1.9)	0.00101* (1.7)	0.1727** (2.0)	0.9727 (0.5)	2.2367* (1.7)	t = 0.27	0.01986	0.332	2.06
(21)	IV (restrictions imposed)	0.2719** (2.3)	-0.0164 (-1.3)	-0.1556** (-2.0)	1.0†	0.00101* (1.8)	0.1143** (2.3)	1.1428 (0.6)	2.1305* (1.8)		0.0201	0.330	2.06
(22)	Seemingly unrelated regressions: wage and price equation (restrictions imposed)	0.3615** (3.7)	-0.0160* (-1.7)	-0.2490** (-3.4)	1.2130** (4.8)	0.00154** (3.4)	0.2226** (3.9)	1.2353 (0.9)	0.1932 (0.2)		0.01986	0.332	1.88
(23)	Seemingly unrelated regressions: wage and price equation (restrictions imposed)	0.3306** (3.7)	-0.0178* (-1.9)	-0.2164** (-3.5)	1.0†	0.00151** (3.3)	0.2068** (3.8)	1.3904 (1.1)	0.1360 (0.2)		0.0202	0.330	1.91
(24)	3SLS (restrictions imposed)	0.2935** (3.0)	-0.0150 (-1.5)	-0.1814** (-2.7)	1.0†	0.00110** (2.4)	0.1532** (2.4)	2.0473 (1.4)	1.3835 (1.4)		0.01943	0.347	1.93

Price equation

Equation of the form: $P = C_0 + C_1$ Wage costs $+ C_2$ Taxes $+ C_3$ Import Prices $+ C_4$ Lagged prices

	C_0	C_1	C_2	C_3	C_4
corresponding to: (22)	-1.0613** (-5.0)	29.986** (11.2)	33.727 (0.5)	0.1032** (7.1)	0.7561** (30.3)
corresponding to: (23)	-1.0718** (-5.0)	30.355** (11.3)	35.679 (0.6)	0.1059** (7.2)	0.7511** (30.1)
corresponding to: (24)	-1.5169** (-5.0)	41.899** (7.2)	22.413* (1.7)	0.0841** (2.5)	0.6860** (12.1)

Notes: For seasonal dummies see Appendix E.

Table 6.4 Estimates of the Restricted Model

Equation is of the form: $\Delta \log W = E_0(1-\gamma IPS_t) + E_1(1-\gamma IPS_t)\log U_{t-1} + E_2\,(1-\gamma IPS_t)\log({}^{rW}/p)_{t-1} + E_3(1-\gamma IPS_t)\Delta\log P + E_4(1-\gamma IPS_t)TIME + \gamma IPS_t \log(1 + {}^{IPI}t/100)$

$+ E_6\ DLPA + E_7\log(1 + {}^{CATCH}/100)$ + seasonal dummies

Equation	Method of Estimation	E_0	E_1	E_2	E_3	E_4	γ	E_6	E_7	Glejser test	RSS	$\bar{R}^2$	DW
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(20)	IV (restrictions imposed)	0.2904* (1.9)	-0.0153 (-1.1)	-0.1741 (-1.4)	1.1158* (1.9)	0.00101* (1.7)	0.1727** (2.0)	0.9727 (0.5)	2.2367* (1.7)	t = 0.27	0.01986	0.332	2.06
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Price equation

Equation of the form: $P = C_0 + C_1$ Wage costs $+ C_2$ Taxes $+ C_3$ Import Prices $+ C_4$ Lagged prices

	C_0	C_1	C_2	C_3	C_4
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corresponding to: (24)	-1.5169** (-5.0)	41.899** (7.2)	22.413* (1.7)	0.0841** (2.5)	0.6860** (12.1)

Notes: For seasonal dummies see Appendix E.

endogenous, the unemployment term becomes insignificant whilst the real wage and time trend terms increase in significance. The coefficient on prices is now insignificantly different from unity. The coefficient on the policy variable is somewhat smaller than the comparable equation for the unrestricted model (18) but overall equation performance is very similar.

Equations (22) and (23) are estimated by treating the wage and price equations as a pair of seemingly unrelated regressions. The unemployment variable now becomes marginally significant and the real wage and time trend variables now increase in significance with an implied speeding up of the catch up of real wages to the desired real wage. The point estimate of the direct policy effect (γ) is now almost identical to that on the policy coefficient in equations (17) and (18).

Finally the wage and price equations are estimated by the method of three-stage least squares (3SLS), which estimates the parameters of all the equations simultaneously using all the information in the model. The results of this estimation are shown in Table 6.4 for equation (24). The main biases emerging from comparison of the OLS results (19) is the increase in the coefficient on prices and its significance, the increased significance of the real wage term, but no marked change in the magnitude of the policy coefficient (γ). The catch-up coefficient is very sensitive to the choice of estimation method however. Comparing the restricted model (shown in Table 6.4) with the unrestricted model (Table 6.3) reveals little difference between overall performance. We are unable to distinguish between the rival hypotheses: first that policy operates linearly as a separate effect (the 'unrestricted' model) and second that policy operates on all the variables in the model (the restricted model).[18] Both models imply that incomes policy has had an effect on aggregate wage inflation but the estimates of γ imply that the average policy effect is fairly small. The final sections of this chapter discuss the properties of the unrestricted models, and the modelling of expectations. The estimates of the contributions of policy to wage inflation over the period are discussed in Chapter 9.

6.4 Properties of the wage models

In this section the properties of the unrestricted and restricted wage models are compared. First the models are considered in isolation and then they are combined with the properties of a simple price equation of the type shown in Tables 6.3 and 6.4.[19] The results are derived by simulation analysis using equation (18) from Table 6.3 as an example of the unrestricted wage model and equation (23) from Table 6.4 as as example of the restricted wage model. The properties of the models are deduced by considering the effects of exogenous shocks compared with a base-run of the model.

Table 6.5 gives the effects on wages of shocks to some of the right-hand side variables assuming fixed prices.

First consider a permanent shock in the level of unemployment of 500,000[20]. Since only lagged unemployment affects wages there is no impact in either model in the first period. The full effect builds up to a peak of 2.1 per cent and 2.7 per cent respectively in the unrestricted and restricted

Table 6.5 **Single-Equation Properties**

Effects of wages (%) from continuous shock in quarter 1 of:

(a) 500,000 in unemployment
(b) 10% in prices
(c) 0.2 on the index of stringency policy (IPS)
(d) 3 percentage points on the wage norm (IPQ)
(e) 10% increase in the average retention ratio
(f) assumes a constant pressure of policy under (b)

Unrestricted equation (18)

	(a)	(b)	(c)	(d)	(e)	(f)
Quarter 1	-	10.0	-0.1	0.4	-	10.0
4	-1.8	4.2	-0.2	1.4	-4.8	10.0
10	-2.1	8.0	-1.8	2.5	-7.7	10.0
20	-1.4	9.6	-1.0	2.1	-8.8	10.0

Restricted equation (23)

	(a)	(b)	(c)	(d)	(e)	(f)
Quarter 1	-	8.8	0.1	0.4	-	8.8
4	-2.4	3.8	-0.8	1.4	-5.2	9.5
10	-2.7	8.1	-2.6	2.4	-8.0	9.9
20	-2.6	9.7	-1.6	1.5	-9.0	10.0

models by the tenth period. In the unrestricted model the effect dies away a little thereafter. This reflects the operation of the real wage resistance effect in the model since with fixed prices an increase in unemployment reduces real wages initially. Nevertheless the rate of catch up is slow.

The effects of a change in price inflation depend on the interpretation of the policy variable in the models. If policy is implicitly assumed to tighten following an increase in prices (since real wage pressure is defined as the wage norm less previous price inflation) then there is an automatic policy response as in simulation (b). However, if the overall stance of policy remains fixed the results are given by simulation (f). Thus for (b) it can be seen that the impact of an increase in prices fades as the automatic policy effect operates but the real wage effect then starts to increase wages. Under (f) there is no such cycle in the effects of a shock to prices. For both simulations (b) and (f) the effects from the restricted model are less than for the unrestricted model where the unit coefficient on prices ensures a complete pass-through of the price effect. In the restrictive equation the price coefficient also equals unity but here the effects depend on the weighting effect from the stringency of policy (IPS). When IPS is zero the full pass-through of prices does take place.[29]

Simulations (c) and (d) examine the policy effects. In simulation (c) the stringency of policy is increased. This reduces wages, as expected, with the effects greater in the restricted model than in the unrestricted model (since IPS also influences the contributions of the other variables in the wage equation). An increase in the wage norm by 3 per cent per annum increases wages but not by the full extent of the change in the wage norm.[22] The results shown under the policy simulations omit the policy catch-up effects. The effect on wages of a change in policy then depend on the direction of change. If for example the overall pressure of policy (IP4) is increased, the catch-up effect built into the base run does not occur and wages are lower by about 0.3 per cent. If however policy pressure is eased then a substantial policy catch-up effect occurs (but only in the current quarter). This adds nearly 1.8 per cent to wages. Thus if simulation (d) were re-designed to incorporate catch-up the increase in wages would be greater throughout but would be particularly increased in the current quarter.

Finally Table 6.5 shows the effect of increasing the average retention ratio (and thus increasing real disposable wages). Since the real wage catch up operates with a lag there is no effect in the current period but after 2½ years wages are 8 per cent lower in both models.

Table 6.6 shows the effects of changing some of the exogenous variables assuming that prices are flexible. The results given are for equation (18).

The effects of changing unemployment are much greater than when prices are fixed but with a much smaller decline in real wages. Similar considerations apply to an increase in the stringency of policy and in an increase in the wage norm. An increase in the retention ratio now leads to a wage effect twice that when prices were fixed but the real wage implications are much the same. Simulation (e) shows the impact of a 10 per cent increase in foreign prices. Less than one half of this increase is reflected in domestic prices although the slow rate of real wage catch-up means that there is a small decline in real wages over a considerable period. Finally simulations (f) to (i) show the effects of temporary shocks. With the exception of a temporary increase in the stringency of policy there are negligible long-term effects.

Next the assumption that the exchange rate is flexible is added to the model. In the results of the simulations where

Table 6.6 Simulation Effects Assuming Endogenous Wages and Prices

Equation (18) - Effects on wages and prices of given shocks.

(a) shock of 500,000 to the level of unemployment
(b) 0.2 on the index of stringency (IPS)
(c) 3 percentage points on the wage norm (IPQ)
(d) 10 per cent increase in the average retention ratio
(e) 10 per cent increase in foreign prices
(f) once-for-all shock of 0.2 on IPS
(g) once-for-all shock of 3 percentage points on IPQ
(h) once-for-all shock of 10 per cent to retention ratio
(i) once-for-all shock of 10 per cent to foreign prices

Wages (%)

	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
t= 0	-	-0.4	0.2	-0.3	1.7	-0.4	0.2	-0.3	1.7
t= 1	-0.9	-0.1	0.8	-2.0	2.9	-0.1	0.4	-2.0	1.2
4	-2.8	-0.1	1.9	-7.0	2.0	-0.3	0.1	-1.6	-0.4
10	-3.6	-2.2	3.3	-12.2	3.2	-0.4	-0.2	-1.1	0.2
20	-3.9	-1.8	4.5	-16.4	3.5	-0.3	-0.2	-0.7	-

Prices (%)

t= 0	-	-	0.1	-	1.8	-	0.1	-	1.8
1	-0.1	-	0.3	-0.4	3.1	-	0.2	-0.4	1.3
4	-1.1	-	0.8	-2.7	3.9	-0.1	0.1	-0.9	-
10	-2.3	-1.5	1.6	-6.8	4.3	-0.4	-0.2	-0.9	0.2
20	-3.3	-1.3	2.7	-9.4	4.0	-0.2	-0.1	-0.2	0.1

only wages and prices were flexible less than one-half of the effects of a change in foreign prices feeds through to domestic costs and prices reflecting the relative weights of wage costs, taxes and import costs in the price equation. Empirical experience of estimating exchange rate equations has not been successful (viz. the collection of papers in Eltis and Sinclair, eds. , 1981). The equation used here is based on data from 1972 (when the exchange rate was floated) through to 1979(Q4) and attempts to model the dollar exchange rate. The equation explains the exchange rate by its past value, the state of the current account and <u>changes</u> in past price competitiveness. Although not empirically a great success this equation does introduce some sensitivity of the exchange rate into the model without imposing a theoretical view of exchange rate behaviour such as purchasing power parity which has been used in illustrative models such as that by Artis and Miller (1979).[23] Table 6.7 reports simulations using wage equation (18) comparable to those of table 6.6 where the exchange rate was fixed whilst Table 6.8 reports similar simulations using wage model (23). Compare first the unemployment simulation using (18). The reduction in wage costs now improves competitiveness and thus raises the level of the exchange rate with a further second round effect on wages and prices so that the longer-run effects on wage-inflation are greater when the exchange rate is flexible. Similar considerations apply to the operation of incomes policy through a tightening of the index of severity of policy (IPS). Both these simulations reduce the level of real wages after five years, more than countering the automatic real wage resistance properties of the equation.

Table 6.7 Simulation Effects: Wages, Prices and the Exchange Rate Flexible : Unrestricted Model

Unrestricted model (18)

(a) shock of 500,000 to level of unemployment
(b) increase of 0.2 in index of stringency
(c) increase of 3 percentage points in wage norm
(d) 10 per cent increase in retention ratio
(e) 10 per cent increase in foreign prices
(f) once-for-all 10 per cent increase in retention ratio
(g) once-for-all 10 per cent increase in foreign prices

Wages (%)

	(a)	(b)	(c)	(d)	(e)	(f)	(g)
Quarter 1	-	-0.1	0.4	-	2.0	-	2.0
4	-2.8	-0.5	2.1	-7.9	4.9	-2.2	0.5
10	-4.8	-3.6	3.7	-15.8	6.5	-1.4	0.7
20	-4.9	-2.6	4.0	-19.2	6.6	-0.4	0.1
Real disposable wage level (Quarter 20) (%)	-2.1	-0.8	1.3	-0.3	-	-	-

Prices (%)

	(a)	(b)	(c)	(d)	(e)	(f)	(g)
Quarter 1	-	-	0.1	-	1.8	-	1.8
4	-1.1	-0.1	0.8	-3.0	4.9	-1.2	0.4
10	-2.7	-1.7	2.0	-8.2	6.4	-1.0	0.6
20	-2.9	-1.9	2.6	-11.4	6.6	-0.3	0.1

Competitiveness (%)

	(a)	(b)	(c)	(d)	(e)	(f)	(g)
Quarter 1	-0.1	-	0.1	-	-7.3	-	-7.3
4	-1.0	-0.1	0.8	-2.8	-1.7	-1.0	1.6
10	-1.8	-1.3	1.4	-6.3	-3.1	-0.7	0.6
20	-2.3	-1.3	1.9	-8.7	-2.8	-0.3	0.2

Note: An increase in the competitiveness measure implies a worsening.

The impact on wages of a reduction in direct taxation (increase in the retention ratio) has an effect which is magnified under flexible exchange rates with a 10 per cent increase leading to a 19 per cent fall in wages and 11 per cent fall in prices (simulation (d)) whilst a once-and-for-all shock in the retention ratio results in very little long-run response.

Finally, a permanent 10 per cent increase in foreign prices has a larger effect on both wages and prices than under fixed exchange rates and there is now no medium-term or long-run real wage effect in contrast to the fall in real wages under fixed exchange rates. A once-for-all shock(simulation (g)) is quite quickly passed through the system however without any marked effect on wage and price levels in the long-run.

The wage impacts under the restricted model (Table 6.8) are in general smaller than those from the unrestricted model (Table 6.7). This reflects the assumption of a non-zero value for the index of the stringency of policy for the simulations (the higher the value of IPS the lower the estimated wage effects).[24] The real wage implications of the simulations are very similar between models (18) and (23) however.

Table 6.8 Simulation Effects: Wages, Prices and the Exchange Rate Flexible: Restricted Model

Restricted model (23)
(IPS = 0.2)
For details of the simulations see Table 6.7

Wages (%)

	(a)	(b)	(c)	(d)	(e)	(f)	(g)
Quarter 1	-	0.3	0.3	-	1.6	-	1.6
4	-3.1	0.4	1.2	-6.5	5.1	-1.4	0.3
10	-4.3	-2.4	2.5	-11.0	5.8	-0.6	0.1
20	-3.5	-2.2	2.0	-11.8	6.2	-	-
real disposable wage (Quarter 20)(%)	-2.5	-1.4	1.2	0.3	-	-	-

Prices (%)

	(a)	(b)	(c)	(d)	(e)	(f)	(g)
Quarter 1	-	-	0.1	-	1.8	-	1.8
4	-0.8	0.2	0.5	-1.5	5.0	-0.5	0.1
10	-1.4	-0.5	0.8	-3.3	6.3	-0.6	0.3
20	-1.0	-0.7	0.7	-3.2	6.3	-	-

Competitiveness (%)

	(a)	(b)	(c)	(d)	(e)	(f)	(g)
Quarter 1	-	-	-	-	-7.4	-	-7.4
4	-0.7	0.1	0.4	-1.1	-1.7	-0.4	1.3
10	-0.9	-0.3	0.5	-2.2	-3.1	-0.2	0.4
20	-0.8	-0.5	0.5	-2.5	-3.0	-0.1	0.1

6.5 Expectations and endogeneity

In section 6.1 it was argued that the main role for the price inflation term in the real wage resistance equation was in terms of expected price inflation. The empirical results so far have used current price inflation as a proxy measure. Under OLS estimation this variable has an insignificant coefficient but IV estimation finds a much more significant effect.

A look at more sophisticated ways of including price expectations is therefore appropriate.

Expectations also arise through the general anticipation effects of incomes policies. Specific allowance for pre-announced policies is described in the previous section but no attempt was made to incorporate more general expectation effects. There are various ways of incorporating expectations in empirical work. One is to use direct survey estimates of expectations. A second is to deduce estimates of expectations from other variables[25]. Third, one can attempt to model the formation of expectations. As soon as this third route is chosen decisions about the precise way in which expectations are formed have to be taken. As Stewart and Wallis (1981) show there is a fundamental difference between approaches which model unobservable expectations variables on the assumption that expectations are extrapolated in some fashion from past experience and are thus exogenous to the system, and approaches which describe the formation of expectations as dependent on current and/or future variables and are consequently endogenous. An example of the former type of expectations is that of adaptive expectations (Cagan, 1958, and Nerlove, 1972) and rational expectations (Muth, 1961) is an example of the latter. Under rational expectations expectations are essentially the same as the predictions of the relevant structural model. In order to apply rational expectations in its true sense it is important to specify the structural model. Ormerod (1982) attempts to apply a rational expectations framework incorporating a real wage resistance model using the reduced form of predictions of the NIESR model to generate a series for the rational expectations on prices. Ormerod concludes that, although the rational expectations formulation explains wage inflation to a greater power than do alternative methods of generating price expectations (i.e autoregressive schemes and substituting actual price inflation for expected inflation) the extra explanatory power does not appear to be significant. Furthermore, he finds it difficult to rationalise the size of the coefficient on price expectations in terms of institutional behaviour. The approach adopted here assumes that the organisation of the labour market is not one where rational expectations are relevant. Most micro studies of wage inflation (e.g. Brown, 1976, Jackson et.al. 1971) stress factors such as comparability , aspirations and past experience rather than expectations. Further evidence against the rational expectations approach to the determination of wage inflation is provided by Pesaran (1982) who uses data from the CBI Industrial Trends survey to reject the hypothesis that inflation expectations are formed rationally.

The rejection of the rational expectations approach does not necessarily imply a return to exogenous expectations variables however. It is still possible to specify alternative expectations mechanisms which may be more ad hoc and less related to the true structural model. For example, expectations of a change in the stance of incomes policy may be related to a rule-of-thumb calculation where the relevant variables might be the recent presence (or absence) of a tight policy, the political complexions of the government and current wage inflation. As with all variants of modelling expectations however it is difficult to test the expectations formation process independently of the model in which it is embedded.

The earlier section of the chapter has discussed alternative measures of price expectations. In forming expectations of the incomes policy measure political factors appear to be important. It has been fairly common (see Chapter 4) for UK governments to eschew tight incomes policy in the early part of its period of power. Thus the length of time since the political party came into power would seem to be important. There does not appear to be any clear-cut rule that Conservative administrations are more likely to impose than Labour administrations but this may be a factor in determining expectations. It is difficult to pursue the matter of policy expectations however until the issues concerning the actual formation have been discussed in Chapters 7 and 8.

6.6 Summary and conclusions

Estimates of two different forms of the wage equation are presented in this chapter. In the first (the unrestricted model) incomes policy enters only as a separate quantity variable whereas in the second (the restricted model) the intensity of policy also affects the coefficients on the other variables in the model. Both models incorporate an announcement/anticipation and catch-up effect of policy. The latter is distinct from the normal real wage catch-up

In both models the overall equation performance is reasonably satisfactory with the policy variables emerging as statistically significant. There is little to choose between the two wage models however. The size of the policy coefficients is between 0.2 and 0.3 and implies a considerable average leakage between the ex-ante and ex-post effects of policy. The best equation performance comes from using the most comprehensive measure of policy, IP4, revealing that the application of policy by government and the degree of resistance by trade unions are important aspects of the influence of incomes policy upon wage inflation. The anticipations variable is not usually statistically significant whereas the policy catch-up variable is. OLS estimation results in a low and insignificant coefficient on price inflation but this coefficient becomes insignificantly different from unity when IV estimation is used. Allowing for endogeneity of policy by adopting instruments does not lead to any major change in either the significance or value of the policy coefficient however.

Some of the properties of the wage models are given by looking at simulations which allow some of the exogenous variables to change. Asymmetry of the policy catch-up effect makes the policy effects on wage inflation depend on the direction of change of policy. The effects on wages of exogenous shocks depend on whether only wages are flexible, wages and prices, or wages, prices and the exchange rate. The main difference between the simulation results using the restricted and unrestricted models depends on the value of IPS, the intensity of policy. For low values of IPS the results are very similar but for higher values of IPS the effect of exogenous shocks is often moderated.

When wages only are flexible an increase in prices is fully translated into higher wage inflation. This is guaranteed by the unit coefficient on prices. Real wage catch-up is also guaranteed in principle by the form of the equation but the adjustment rate is quite slow. A permanent increase in unemployment can lead to a permanent reduction in real wages for a considerable period (as in the theoretical model of Artis and Miller, 1979). Under flexible prices, a permanent increase in unemployment can still lead to a permanent reduction in real wages and, although a shock to foreign prices ultimately leads to no fall in real wages, the slow rate of real wage adjustment results in a reduction of real wages for a considerable period. When the exchange rate is also made flexible a permanent increase in unemployment or a permanent increase in policy pressure can still result in permanently lower real wages but a permanent rise in foreign prices does not and now leads to considerably higher inflation.

Notes to Chapter 6

1. Brown (1981) reports that single-employment bargaining has become the most important means of pay determination for two-thirds of manual workers. Among non-manual workers the proportion is three-quarters of employees.

2. But proportional changes would depend on the previous level of wages of all groups.

3. Evidence from the Aberdeen database reveals a median contract length of 51.4 weeks, a mean of 51.7 weeks and a standard deviation of 10.6 weeks. I am indebted to R. Elliott of Aberdeen University for access to this data.

4. A major limitation of the usefulness of ϕ is that it refers only to industry-wide settlements and does not capture any of the growing influences due to local bargaining.

5. The regression estimated by OLS over the period 1961-75 is:

$$\underset{(6.3)}{DUR = 47.806} + \underset{(0.8)}{0.558\ IP4} - \underset{(-3.8)}{433.63\Delta \log P} + \underset{(1.0)}{0.1048 TIME}$$

+ seasonal dummies

Figures in brackets represent t - ratios

$\bar{R}^2 = 0.332$ D.W = 1.18 S.E. = 9.14 weeks

DUR is the average length of manual wage settlements, IP4 the measure of incomes policy and P the price level.

6. In its limit a wage freeze would reduce the number of settlements to zero and lead to an infinite increase in the dependent variable.

7. If the average length of contract were already greater than 12 months the introduction of such a rule might even shorten the average contract length.

8. Some support for this interpretation is given by the regression on contract length described in footnote 5.

9. This result holds whether the settlement proportion is used as an additional variable on the right hand side of the equation or used to deflate the dependent variable as in the work of Ashenfelter and Pencavel (1975).

10. This may be a consequence of a formal 12-month rule laid down by policy or by informal bargaining arrangements which also place constraints on the variation in the settlement interval.

11. Developed by D.F. Hendry and F. Srba of L.S.E., and part of the AUTOREG library.

12. When the term in real wages lagged by two periods was omitted, policy dummies for the periods 1969 (suprisingly), 1975-6, 1976-7, and 1977-8 were all significantly different from zero. The definitions of the dummy variables are given in Appendix B. In general they are defined as equal to unity in periods of policy "on" and zero in policy "off".

13. Tests of higher order serial correlation processes are consistently rejected.

14. 'PSTAB', kindly provided by M. Salmon of the University of Warwick.

15. This is a reasonably standard form in the macroeconomic modelling literature, see Ormerod, 1979.

16. The test consists of using the OLS residuals (e_i) to run a second regression

$$e_i = \lambda_0 + \lambda_1 k_t$$

17. An alternative test, the Breusch-Pagan test, requires all the explanatory variables, together with k, to be exogenous and so is not appropriate here.

18. Comparing the estimation of the restricted model without imposing the common policy effect on all the variables rejects the common policy effect but leads to implausible implied values for γ on some of the variables.

19. The actual price equation used is:

$$P = \underset{(-5.6)}{-1.7529^{**}} + \underset{(7.7)}{35.747^{**}}WC + \underset{(4.2)}{43.846^{**}}TAX + \underset{(4.4)}{0.1238}PM^{**}$$

$$+ \underset{(15.3)}{0.6557^{**}}P_{t-1}$$

RSS = 43.7 S·E = 1.1% Durbin 'h' = 0.63

where P refers to retail prices, WC to unit wage costs, TAX to unit taxes and PM to import prices. Figures in brackets are t-ratios and ** denotes statistically significant at 95%.

20. This represents a considerable shock in the first period.

21. The results shown use a value of 0.2 for IPS.

22. The similarities described here assume no endogenous policy catch-up effect. If the policy catch up is allowed to operate the wage response to an increase in the wage norm would be greater throughout with the catch-up effect operating in the first period.

23. The estimated exchange rate equation is:-

$$\log(EXCH) = \underset{(2.2)}{0.3925^{**}} + \underset{(0.6)}{0.000014}\,BAL + \underset{(22.2)}{0.90697^{**}}\log(EXCH)_{t-1}$$

$$-\underset{(-1.0)}{0.2201}\Delta COMP_{t-3} - \underset{(-1.6)}{0.2340}\Delta COMP_{t-4} - \underset{(-1.4)}{0.2203}\Delta COMP_{t-5}$$

$$-\underset{(-1.2)}{0.1762}\Delta COMP_{t-6} - \underset{(-1.0)}{0.1028}\Delta COMP_{t-7}$$

Estimation by Almon least squares

$$\bar{R}^2 = 0.951 \quad RSS = .0295 \quad \text{Durbin 'h'} = 0.49$$

24. Although with a zero value for IPS the properties of the two models are very similar.

25. For example, by deducing price expectations from movements in nominal interest rates, e.g. Fama (1975).

CHAPTER 7 ENDOGENEITY OF POLICY - SOME METHODOLOGICAL CONSIDERATIONS

7.1 Introduction

The concept of a policy reaction function has been applied to the UK by Fisher (1970) and Pissarides (1972) using the form of quadratic optimisation developed by Theil (1964). These models have been extended by Jonson (1974) who applies his analysis to the Australian economy. Criticisms of the Theil approach have led others (e.g. Mosley, 1976) to adopt an alternative approach to policy (the 'satisficing' approach). The relevance of policy reaction functions is stressed by Goldfield and Blinder (1972) who argue that the classical bias in the structural parameters of a model resulting from treating policy variables as exogenous when they are really endogenous is not usually severe. However, the policy results derived from the reduced form of the whole model may be quite misleading. The importance of incorporating policy reaction has been given an extra impetus with the paper by Lucas (1976). Lucas argues that econometric model predictions will be affected by private agents' perception of policy and that their adjustment to changes in policy will vary with alternative policies. Consequently the so-called structural parameters are not constant. The Lucas argument can be incorporated into existing models by incorporating explicit policy reaction functions of the authorities and relating the behaviour of private agents to resultant policy variables.

A large part of the empirical research involving explicit policy reaction functions has concentrated on monetary variables although some authors (e.g. Pissarides, 1972) have considered a more comprehensive set of policy variables. However, to date policy reaction functions have not been applied to incomes policy. The main purpose of this chapter is to evaluate the alternative approaches to policy reaction functions and to develop ways of applying policy reaction functions to incomes policy in the UK over the period 1961-1979.

In this chapter we consider the structure and final form of alternative approaches to the policy reaction problem. In Chapter 8 the results of applying versions of the Theil approach to incomes policy variables are discussed, both in a form where policy instruments are independent of each other and in a simultaneous setting.

7.2 The Theil approach and its limitations

7.2.1 General considerations

The basic framework used here initially starts from the quadratic objective function of Theil (1964). This has been the most common approach in empirical work and has been applied to the UK by Fisher (1970) and Pissarides (1972) among others.

The general form of estimating equation has been:

$$X_t = Q_1 X^* + Q_2 X_{t-1} + Q_3 (Y_t - Y^*)$$

where X is the policy instrument Y is the target or goal variable and X* and Y* are the desired levels of X and Y respectively. One of the common criticisms of the approach is that the desired values of the targets and instruments have been taken to be either constant or zero whereas it would seem that the authorities may well have used an adaptive approach (see Wass, 1978).

A second criticism has been made by Nobay (1974). Here it is argued that policy is set simultaneously so that it is invalid to treat each decision about a policy variable as independent. To fully accommodate this criticism requires either a full simultaneous model of policy determination or allowance made for simultaneity in a single equation approach.

Makin (1976) has shown that the published work on reaction functions cannot be used to derive implications about the preference trade-offs between various objectives by the authorities except under restrictive assumptions about the authorities' view of the relationship between the instruments of policy and policy targets. In the past few years the Treasury has been obliged to publish the details of its economic model and it might be argued that this provides an ideal measure of the authorities' view of the actual trade-offs in the economy. However, it has recently been made clear that the Treasury model does not always coincide with the policy-makers' views. In addition, the versions of the published model have differed considerably in the three or more years that they have been generally available. Compare, for example, the results described by Laury, Lewis and Ormerod (1978) and those published in Ormerod (ed.,1979). It is therefore clear that there is no one 'model' that can be used to interpret policy actions of the past. A reaction function model therefore needs to be able to cope with both the changing preferences of policy makers and the changing perceptions of their view of the economy.

Perhaps an even more damning criticism of the standard reaction function model is that the authorities are assumed to react to current or past values of the target variables. In practice the authorities typically have information on expected economic developments and it may be more plausible that they will react to forecast developments rather than to current or past events especially when changes in instruments are likely to have a lagged effect on policy goals. Empirical relationships between policy instruments and targets which reveal a zero correlation may not necessarily imply that the authorities are insensitive to economic developments but rather that they have correctly foreseen these events and already reacted accordingly. Using forward or expected measures of the policy targets in any case avoids the possible simultaneity problem whereby current period values of the instruments have some impact on the target as well as the line of causation implied by the reaction function approach. However, the description of policy in Chapter 4 suggests that the authorities may have reacted to past events rather than anticipated future outcomes.

The Theil or quadratic utility function approach also implies a degree of flexibility of policy instruments which is either not available in practice or only available at considerable cost. This would seem to apply particularly to the treatment of incomes policy where the operation of the policy has often involved the preparation of statutory or enabling legislation, or of the publications of necessary rules and institutions. Thus in practice policy tends to have a degree of inertia inconsistent with the quadratic utility function approach. Policy inertia can also be explained,not by the cost of changing policy, but because of the uncertainty of economic developments or even uncertainty about the effect of the policy instruments on the goals of policy.

Blackaby (ed., 1978) argues that changes in objectives have in the past been related to changes in the authorities' belief that they could achieve these objectives so that changing structure and changing objectives have been related. He also criticises approaches which assume a simultaneous setting of policy objective and instruments by arguing that over the period 1960-74 policy had followed the pattern of one thing at a time and one idea at a time rather than the careful balancing of ultimate objectives.

7.2.2 Comparison of the Theil approach with other methods

The standard derivation of reaction functions using a quadratic utility function following Theil (1964) is as follows: [1]

The basic methodology is to maximise $u = U(y,x)$ (7.1)

subject to the constraint $y = Rx + S$ (7.2)

where y, x and s are all vectors and refer to target variables, instruments and the set of exogenous influences respectively. The first equation represents the utility of objective function of the authorities' and the second equation is the reduced form of the authorities' view of the economic structure. x and y are more appropriately defined as the deviations of the instruments and targets from their desired levels. Assuming that the nature of the utility function is quadratic gives:

$u = a'x + b'y + \frac{1}{2}(x'Vx + y'Wy + x'Cy + y'Cx)$ (7.3)

where V is the matrix of weights attached to deviations of policy instruments from their desired values and W is the corresponding matrix for policy targets. C is the matrix of cross-product weights between policy targets and insruments.

Maximising (7.3) subject to the constraint (7.2) gives the following first order conditions :

$$\begin{bmatrix} V & C & R' \\ C' & W & -I \\ R & -I & O \end{bmatrix} \begin{bmatrix} x \\ y \\ \lambda \end{bmatrix} = \begin{bmatrix} -a \\ -b \\ -s \end{bmatrix}$$

Second order conditions require the weights w_i and v_j to be positive. Substitution for λ gives the following expression in

$$x = - K^{-1} V^{-1} R^{-1}b - K^{-1}V^{-1}R^{-1}Wy - K^{-1} V^{-1} Cy - K^{-1}V^{-1}a \qquad (7.4)$$

$$\text{where } K = \left[I + V^{-1} R' C' \right] \qquad (7.5)$$

remembering that $x = X-X^*$ and $y = Y-Y^*$

where starred variables indicate desired or target values

and an estimating equation:

$$X - X^* = a_o + a_1 \ (Y - Y^*) \qquad (7.6)$$

and $a_1 = -K^{-1} V^{-1} \ (R'b + a)$

and $a_1 = -K^{-1} V^{-1} \ (R'W + C)$

Regressing deviations of instrument variables on deviations of target variables gives a set of coefficients which are an amalgam of W, R, V and C so that the true set of preference weights cannot be determined except by knowledge of R. If C is a null matrix, which is a plausible proposition, then (7.4) becomes:

$$x = -V^{-1}R'b - V^{-1}R'Wy - V^{-1}a \qquad (7.7)$$

and the estimating form is now:

$$X - X^* = b_o + b_1 \ (Y - Y^*) \qquad (7.8)$$

where $b_o = -V^{-1} \ (R'b + a)$

and $b_1 = -V^{-1}R'W$

(7.8) is identical to (7.6) so that it is not possible to determine empirically whether it is appropriate to include C or not. It is still impossible to determine W without knowledge of R.

If we further simplify the model to exclude the constant terms a and b then we obtain:

$$x = -V^{-1}R^{1}Wy \tag{7.9}$$

which is estimated as:

$$X - X^* = c_1 (Y-Y^*) \tag{7.10}$$

with c_1 given by $-V^{-1}R'W'$

The model remains unidentified. This type of model was estimated by Pissarides (1972).

Jonson (1974) sets out an alternative formulation which allows for the costs of changing policy to be entered into the utility/loss function and extends the analysis to two periods. This cost function is:

$$C = Y_t' W_t Y_t + Y_{t+1}' W_{t+1} Y_{t+1} + x_t' V_t x_t + x'_{t+1} V_{t+1} x_{t+1}$$

$$+ x_t' K_t x_t + x'_{t+1} K_{t+1} x_t \tag{7.11}$$

where $Y_t = Y_t - Y^*$ and $Y_{t+1} = Y_{t+1} - Y^*$

and K is the cost function relating to the change in policy instruments.

The constraint is now:

$$Y_t = RX_t + B_1 X_{t-1} + B_2 Y_{t-1} + B_3 S_t$$

$$\text{and} \quad Y_{t+1} = RX_{t+1} + B_1 X_t + B_2 Y_t + B_3 S_{t+1} \tag{7.12}$$

Maximising (7.11) subject to (7.12) gives:

$$X_t = A^{-1} (V_t + K_{t+1} (V_{t+1} + K_{t+1})^{-1} V_{t+1}) X^* + A^{-1} K_t X_{t-1}$$

$$- A^{-1} R' W_t (Y_t - Y^*_t)$$

$$- A^{-1} (R'B_2' + B_1' + K_{t+1} (V_{t+1} + K_{t+1})^{-1} R') W_{t+1} (Y_{t+1} - Y^*) \tag{7.13}$$

where $A = V_t + K_t + K_{t+1} (I - (V_{t+1} + K_{t+1})^{-1} K_{t+1})$

the estimating equation is:

$$X_t - X^* = d_o X_{t-1} + d_1 (Y_t - Y^*_t) + d_2 (Y_{t+1} - Y^*) \qquad (7.14)$$

This differs from (7.10) in the inclusion of lagged instrument values and the inclusion of the future deviation of the policy targets. Jonson shows that in the single-period case:

i.e. where $V_{t+1} = W_{t+1} = K_{t+1} = 0$

then (7.13) reduces to

$$X_t = (V_t + K_t)^{-1} V_t X^* + (V_t + K_t)^{-1} K_t X_{t-1} - (V_t + K_t)^{-1} R' W_t (Y_t - Y^*) \qquad (7.15)$$

which gives an estimating form:

$$X_t = e_o X^* + e_1 X_{t-1} + e_2 (Y_t - Y^*) \qquad (7.16)$$

It still remains the case that we cannot identify W without information on R.

Let us return to model (7.9). Makin (1976) shows that for the simple case m = n = 2, we can write:

$$x_1 = -\frac{r_{11} w_{11} + r_{21} w_{21}}{v_1} \cdot y_1 - \frac{r_{11} w_{12} + r_{21} w_{22}}{v_2} \cdot y_2$$

$$x_2 = -\frac{r_{12} w_{11} + r_{22} w_{21}}{v_1} \cdot y_1 - \frac{r_{12} w_{12} + r_{22} w_{22}}{v_2} \cdot y_2$$

dividing the coefficients of Y_1 and Y_2 for equation X_1 by each other gives:

$$\frac{r_{11}w_{11} + r_{21}w_{21}}{r_{11}w_{12} + r_{21}w_{22}}$$

if cross product terms in w are zero, i.e. the disutility from inflation is independent of disutility from unemployment then this reduces to:

$$\frac{r_{11}w_{11}}{r_{21}w_{21}}$$

if we know the values of the reduced form coefficients, r_{ij}, then it may be plausible to obtain estimates of the w_{ij}. Makin shows that if m = n = 2 there are four equations and five unknowns so that here we can only obtain relative preferences.

Makin generalises the results to the multiple target - multiple instrument case where W is symmetric. A solution is possible when n,the number of goal variables: n = m + (m-2). On these grounds the model of Pissarides (1972) is not unique whereas that of Friedlander (1973) is. Makin also shows that the addition of lags either between instruments and targets or vice versa can ease the problems of underdeterminacy. Papers by Waud (1976) and Brainard (1967) deal specifically with the issues of uncertainty and asymmetry in the utility function - common criticisms of the Theil approach.

Brainard shows that uncertainty about the effect of the exogenous variables (the vector s) does not affect the choice of policy as the policymaker merely substitutes the expected value of s for s. However, if the uncertainty concerns the impact of the instruments on the policy targets, i.e. if R is uncertain, then optimal policy will need to incorporate the variance in R. Implied optimal policy will not in consequence be such as to attempt to reach Y* (the desired policy goal) but may be such as to undershoot or overshoot depending on the nature of the gap between Y and Y* and on the nature of the correlation between uncertainty about the matrix of reduced form-coefficients and the vector of exogenous effects. Waud deals with the problem of asymmetry whereby policy makers may be more concerned with deviations of Y below Y* than above it and shows that even when there is no uncertainty this implies that the authorities will not aim for Y*. This approach is related to the piecewise quadratic approach which was developed by Friedman (1975) and to some extent has similarities to the satisficing approach of Mosley (1976). However, first we consider the relationship of the Theil approach to methods of stabilisation policy which are not based on the assumption of optimising a quadratic utility function.

Phillips (1957) has developed several alternative stabilisation policy models. The first of these is proportional policy where the desired level of policy instrument

$$X^* = \gamma(Y-Y^*)$$

(X*) is set by the gap between the outturn and the desired level of the policy variable. He later refined this so that X* was defined not as the level of X but the deviation of X from its steady state level($\bar{x}$).This rule is identical to the Theil formulation if X*, the long run desired level of X, is zero. The second formulation can be called integral policy correction where

$$\dot{x}_t = \gamma\,(Y_t - Y^*)$$

This is identical to the Theil approach of equation (7.10) where X^*_t is approximated by its lagged value X_{t-1}.

The third formulation is derivative policy where

$$x = -\gamma(Y_t - Y_{t-1})$$

This is equivalent of the standard Theil result with X* equal to zero and Y* given by its lagged value Y_{t-1}.

Theil optimisation can be seen as a set of optimal decision rules showing how the set of instruments, x, is varied in response to initial conditions (Y-Y*) and the influence of non-policy exogenous variables (s). As s enters the solution in a linear fashion the Theil approach of quadratic optimisation subject to linear equality constraints gives decision rules which are themselves linear. The set of decision rules formulated by Phillips are thus seen to be similar in concept but differ in that they do not follow from explicit analytical optimisation. In particular, the Phillips rules express the values of instrument variables as functions of observed differences between previously observed actual and desired target values whereas the Theil rule determines the difference as functions of the vector of exogenous influences, s.

We have already referred to the costs of adjustment of x and this was introduced in a very specific form by Jonson (1974). Turnovsky (1977) has shown that, for the one instrument - one target case, the policy instrument will be adjusted to close some proportion of the gap when costs of adjustment exist so that $x = \lambda\ (x-x^*)$ where x is the optimal value of x and λ the rate of adjustment. For multiple instruments and targets the change in each policy instrument is determined not only by its own deviation from the optimal level but by the deviation of other variables from their optimal level.

It is important to remember that in this analysis we are concerned with the description of actual policy and not with how policy might have been more successfully applied. This means that some of the more complex studies of optimal control are not applicable for the present analysis. Theil has extended his model to a multi-period time horizon. Under certainty the first period decision can be obtained by replacing the additive disturbances in the constraint by their expected values and optimising the multi-period objective function with respect to the decision variable for all periods and then solving for the first period subvector. Decisions for subsequent periods are later modified as more information becomes available.

Turnovsky considers the multiperiod problem in terms of control theory using the dynamic system:

$$Y_t = AY_{t-1} + BX_t$$

with long run solution $Y^* = AY^* + BX^*$. The quadratic cost function of being away from equilibrium is given by:

$$C = \sum_{t=1}^{T} (Y_t - Y^*)'M(Y_t - Y^*) + \sum_{t=1}^{T} (X_t - X^*)'N(X_t - X^*)$$ where M is the cost matrix. This leads to a linear feedback control law

$$X_t = R_t Y_{t-1}$$

where $R_t = -\left[N + B'S_tB\right]^{-1}\left[B'S_tA\right]$ and S_{t-1} is given by

$$M + R_t' NR_t + (A + BR_t)'S_t(A + BR_t)$$

This is a generalised form of the Phillips' rule using proportional adjustment policy although the constant of proportionality is a function of time. Turnovsky also considers stochastic systems using the model minimising the expected value of $E(y_t'My_t + x_t'Nx_t)$ subject to

$$y_t = (A + V_t)Y_{t-1} + (B + W_t)X_t + u_t$$

where V_t and W_t denote the random components of the coefficients. Given certain restrictions this implies a feedback rule

$$X_t = RY_{t-1}$$

where $R = -\left[N + B'SB + E(W'SW)\right]^{-1}\left[B'SA + E(WSV)\right]$

and $S = M + R'NR + (A + BR)'S\,(A + BR) + E\left[(V + WR)'S(V + WR)\right]$

The only difference from the deterministic case is that the optimal stabilisation policy depends on the stochastic disturbances in parameters. If these are zero the solution is the same as in the deterministic case.

Friedman (1975) shows that dynamic programming techniques allow for more generality in the admissible functional forms than does the more restricted quadratic optimisation approach. The dynamic programming approach decomposes the larger multi-stage problem into a sequence of smaller single-stage problems whereas the quadratic optimisation approach has a direct analytical solution from a single set of simultaneous equations. The dynamic programming approach essentially decomposes the initial T-period optimisation into T one-period optimisation problems with the (T-1) solution, for example, embedded in the solution for period T. The solution to the one period optimisation problem is parallel to the Theil solution method. Friedman (1975) shows that the Theil quadratic optimisation methodology and the Bellman (1957) dynamic programming methodology are parallel ways of solving equivalent problems for deterministic systems.

Friedman (1975) formally deals with the symmetry problems connected with the Theil approach by specifying a piecewise quadratic function. Here for each target and instrument variable two fixed values separate the whole range of possible values into three disjoint convex sets. The middle range is a closed, bounded set of values with a zero preference loss and the two extreme ranges contain values with non-zero preference losses. Two distinct quadratic functions, one defined for either extreme range, determine these losses constructed so that the two functions approach limiting values of zero as the argument variable approaches either boundary of its middle range; the two quadratic functions are not defined for the boundary points themselves.

For the standard quadratic function with the form:

$$W(x,y) = a'X + b'y + \tfrac{1}{2}(x'Ax + y'By + x'Cy + y'C'x)$$

with a, b null vectors and c a null matrix for simplicity

$$W(x,y) = \tfrac{1}{2}(x'Ax + y'By)$$

where the constant criterion coefficient b_{ii} is replaced by:

$$b_{ii} = b^u_{ii} \text{ if } y_i \in U(y_i) = \{y_i | y_i > y^u_i\}$$

$$= 0 \text{ if } y_i \in M(y_i) = \{y_i | y^l_i \leq y_i \leq y^u_i\}$$

$$= b^l_{ii} \text{ if } y_i \in L(y_i) = \{y_i | y_i < y^l_i\}$$

where b^u_{ii} = coefficient applied to values of y_i in $U(y_i)$, the upper extreme set.

b^L_{ii} = coefficient applied to values of y_i in $L(y_i)$, the lower extreme set.

y^u_i is the upper boundary point of $M(y_i)$, the middle set for y_i

y^L_i is the lower boundary point of $M(y_i)$

y_i is given by $y_i = y_i - y^u_i$ if $y_i \in U(y_i)$

$= y_i - y^u_i$ or $y^L_i - y_i$ if $y_i \in M(y_i)$

$= y^l_i - y_i)$ if $y_i \in L(y_i)$

symmetry is given by $b^u_{ii} = b^l_{ii}$ and strict convexity by $y^u_i = y^l_i$

Using this approach the Theil model can incorporate inequality constraints whilst still staying in the same basic framework.

Mosley (1976) adopts a slightly different modification to the basic Theil approach. He, too, finds the symmetry assumption to be unreasonable but in addition he argues that desired values of targets are seldom formulated in explicit quantitative terms. He believes that the authorities have adopted an ex post response to crises resulting from the unacceptable levels of targets rather than an ex ante approach which optimises a function of those targets. Mosley terms his approach one of 'satisficing' rather than 'optimising' and applies it to the British economy over the period 1946 to 1971. The satisficing approach has four basic principles. The first is that targets are framed in acceptable levels rather than optimum levels. As long as this acceptable level can be quantified it can easily replace the optimal level Y* in the Theil framework however. The only difficulty arises if this acceptable level is itself related to the actual performance of the economy (Y). In this instance Y* can be expressed as a function of the vector Y. The implications of this change, however, suggest some sort of adaptive or moving average approach to the treatment of policy targets.

The second principle is that of sequential consideration of alternatives i.e. concentration normally on one target at a time rather than on the simultaneous achievement of multiple goals. This point is also made by Blackaby (ed., 1978). One could argue against this point that it does not necessarily invalidate the general approach of Theil specifically as modified by Friedman as this also implies that attention will be concentrated on target variables that stray some way from their desired value. What would be inconsistent with the Theil model would be frequent temporary abandonment of particular policy objectives when one or more policy objectives were equally at variance with their desired values. It may be argued that this has happened under the Conservative Government which came into power in 1979, where full employment objective as been shelved in favour of the inflation target. If this were generally true then the underlying preference function must be considered to be unstable and policy reaction functions could only be estimated by taking account of case by case instances of the implied preference function. The approach could still be a useful mechanism for appraising past policy formation but would lose a considerable degree of generality and could not be very usefully applied to future economic situations unless one could explain these frequent preference adjustments by some other variables which in turn were amenable to predictions.

The third principle of satisficing theory is that satisfactory levels of targets are reached by resolution, usually through compromise, of a conflict between various groups in the policy making circle. This would not matter for the Theil approach if the groups all had identical preference functions but to the extent that these differ and that various groups will dominate in the policy-making process at different times then again (for example, Keegan and Pennant-Rea, 1979) preference functions will be subject to frequent (and not easily explained) shifts. The fourth principle relates to flexible targets. This is very similar to the first principle and can be treated in the same manner.

The basic implication that satisficing theory has for the optimising approach is that the preference function may be inherently unstable. The solution without the optimising approach to this problem is to adopt a subjective interpretation of the preference function at various points in time.

Mosley in his approach attempts to avoid this problem by looking first at instrument changes and identifying periods in which these changes were particularly sharp. He then looks for the "crisis" variable which provoked this response. Mosley argues that "crisis" periods of reflationary instrumental change appear to be most closely related to peaks in unemployment and that "crisis" periods of deflationary instrumental change appear to be most closely related to troughs in the balance of payments but that there was no consistent pattern of response to movements in the retail price index or the growth rate of GDP.

This may merely reflect the absence of auy major inflationary crisis in the period of analysis, however, especially as he ignores the imposition of incomes policy as an instrument. If incomes policy were assigned to deal with inflationary pressures, then one might not have expected to find any relation between inflation and other policy instruments.

The formal approach adopted by Mosley is a kinked reaction function of the form

$$\Delta x_{i(t)} = \alpha + \beta(y_i - y_i^*)_{t-k} \text{ when } y_i < y_i^*$$

$$\Delta x_i = 0 \text{ when } y_i > y^*$$

This can be seen as a special case of the Friedman piecewise quadratic function.

Mosley obtains the value of y^* for unemployment by using a trend line through the actual observations of unemployment; for the balance of payments $y^* = 0$. Mosley's model was obtained on data for the UK economy for 1946-71 using budget changes in taxes and changes in public investment as the dependent variables. He does find different coefficients on the crisis and non-crisis periods but only the equations for budget tax changes are satisfactory.

Mosley adopts a single target-instrument equation system whereby budget tax changes, for example, are explained by either unemployment or the balance of payments but not both simultaneously. He does not attempt to compare the influence of these alternative targets indirectly either. Given that public expenditure changes are not explained at all well by the current balance whereas there is a significant relationship between the former and unemployment the inference must be that tax changes were used to regulate the balance of payments. Mosley's choice of public investment as an instrument is a little surprising since the work of Price (1978) suggests that public investment has not been used as a counter-cyclical device.

7.3 A synthesis of Theil and other approaches applied to the UK

In the previous section we have outlined the Theil approach and shown its basic similarity to other methods of policy analysis. We have also discussed the limitations or criticisms of the standard Theil methodology and shown how Friedman (1975) and Mosley (1976) have attempted to circumvent them.

The main criticisms can be classified as follows:

(i) the appropriate formulation of the target levels of these instruments and targets (X^* and Y^*).

   (a) are these constant or adaptive? If they are adaptive, what adaptive rule is appropriate, or are X^* and Y^* derived from a preference function which is inherently unstable

   (b) are reactions to $Y-Y^*$ asymmetric?

   (c) have some variables alternated between instrument and target variables, e.g. interest rates; or have some variables (for example, the PSBR) been used as indicators of the effects of policy?

(d) is the appropriate formulation of Y in past terms or in expected values? i.e. do the authorities react to past changes or to expected future changes in the target variables?

(ii) What is the basic nature of policy setting?

(a) is it simultaneous or independent? If it is simultaneous, then it is appropriate to use single-equation techniques to derive policy reaction functions. If it is sequential as argued by Blackaby (ed., 1978), then single-equation techniques are valid.

(b) how can we capture changing the authorities' changing views of the economy?

(c) how is uncertainty about the authorities' view of the economy incorporated and, in particular, how do we allow for changing degrees of uncertainty?

(d) what is the role of political factors?

(iii) How do we allow for a lack of flexibility in the setting of instruments?

(a) are there constitutional or technical constraints to the flexibility of some policy instruments?

(b) how are institutional changes incorporated into the framework? For example, is the change to floating exchange rates in 1972-3 a policy instrument or not? What about the introduction of Competition and Credit Control in 1971?

7.4. Appropriate formulation of X* and Y*

The preference function

It would seem clear from a description of economic policy between 1960 and 1979 that it is implausible to expect that some target values have remained constant. In particular there is some *a priori* evidence that both higher levels of unemployment and inflation are now more acceptable than they were in 1960, say. This may reflect a shift in the underlying preference function or a change in view by the authorities regarding their ability to achieve the targets. By allowing for this shift we are then also incorporating some of the factors in (ii) (b). In other words we would adopt the assumption that changing preference patterns are not independent of changing views of the underlying economic structure.

Adaptive procedures such as a distributed lag on past values of the target variable or a deviation from moving average is one of the ways of allowing for such systematic shifts. Thus the underlying nature of the utility function is regarded as constant. An alternative approach would be to use varying parameter methods (e.g. Cooley and Prescott, 1972).

If, however, the preference function is such that the relative preference weights are variable and non-systematic, then it is probably fair to say that no reaction function which is built upon a standard modelling framework will prove acceptable. Mosley's approach falls by the wayside along with the Theil approach in this respect. As long as the changing preference weights are systematic then it is possible to represent the derived values of Y* and X* in some tractable form. The first impression gained from the accounts of Blackaby (ed.,1978) and Keegan and Pennant-Rea (1979) suggests that changes in preferences were subject to diverse influences and subsequently the outcome of these varying influences was not a systematic set of preferences. However, an alternative interpretation of recent economic history is that preferences have not been variable but that policy actions have been determined by the degree of success in achieving certain targets. For example, the switch in policy objective from anti-inflation policy to anti-unemployment policy might be explained by the more critical position of unemployment and is therefore not inconsistent with the reaction function approach. Only if periods of identical inflation and unemployment pressure saw different policy responses would the reaction function approach be less valid. Even in these cases the approach can be salvaged if the change in priorities can be explained systematically. For example, we might want to allow that different political complexions of government might have different policy preferences or that the relative policy preferences were dependent on the distance from the next election. Interpretation of recent economic history does lead to the conclusion however, that the symmetric approach to policy formation may not be entirely plausible and that the "crisis" approach is more appropriate. Thus the quadratic piece-wise approach of Friedman (1975) or the approach of Mosley are appropriate with the Friedman approach being the more general of the two.

Choice of X^*

Generally, desired values of X^*, the instrument vector, have been set to zero or equated with the lagged value of the instrument. Clearly a zero value is appropriate when this is the median policy value of the variable. In other cases, however, it is more appropriate to use the lagged value of X. Note that in formulations of the reaction function which explicitly include costs of adjustment the variable X_{t-1} is correctly included so that it is not then reasonable to interpret the lagged values of X when proxying X* as a measure of policy inertia.

Intermediate targets

The use of intermediate targets such as the PSBR is one way of incorporating changing views held by the authorities about the nature of the economic system. Changing emphasis on these variables can therefore provide some information about views on the structure of the economy. In the same way that the piece-wise approach can incorporate different degrees of sensitivity to changes in the target variables so allowance for alternative targets and for different sensitivity to them can generalise the model.

Past or future Y

The issue of whether the appropriate formulation of the target variables in the reaction function should be past values of the target or expected future variables is ultimately an empirical issue since the arguments run both ways. On the one hand a more consistent approach by the authorities would relate changes in policy instruments to changes in the expected economic environment since policy would affect the targets with a lag. On the other hand the view that the authorities were essentially myopic and only reacted once events were upon them would favour the use of past values of Y. Use of current values of Y would imply an assumption regarding the information and reaction lag of policy which may not be credible in a quarterly setting. In addition this might pose simultaneity problems between the targets and the instruments.

Simultaneous policy setting

Nobay (1974) has criticised some formulations of the reaction function approach for their implicit assumption that policy instruments are independently set since he argues that in practice the structure of policy-making is "hierarchical with a parallel structure controlling the links within the process of economic policy". Inter-relationships between instrument changes may also arise as a consequence of the lack of flexibility of some instruments. That criticism can easily be taken into account by including appropriate instrument sets in the equation and estimating by an appropriate econometric technique.

Changing views of the economy

As we have shown earlier the reaction function approach incorporates both the utility function of the authorities and their view of the economy. The best way to treat these problems appears to be to assume that the underlying decision process is constant so that the authorities react in a constant manner to certain stimuli. What might then change is the measurement of these stimuli. Thus in the case of changes in the utility function we have already agreed that these can be accommodated by using appropriate definitions of the target variables Y*. To some extent this can also apply to changing views of the structure in that authorities may respond to different values of the instruments or target variables. Systematic changes of this sort can be captured by adaptive regression techniques as we argued earlier for changes in the utility function weights.

Nobay (1974) suggests that some general indicator of policy might be used to capture the various aspects of fiscal policy, thus avoiding specifying individual fiscal instruments. He uses the first-round effects on GDP of tax changes. This measure is only partial, however, and the probability of finding a suitable indicator of monetary policy is low (see Chapter 4).

Uncertainty

As we note earlier the work of Brainard (1967) distinguishes between uncertainty about the vector of exogenous influences and uncertainty about the set of reduced-form parameters. If the latter is the source of uncertainty and this is a plausible representation of policy formation, then we need to know the variance of the reduced form parameters. Clearly, this is an impossible task. If the degree of uncertainty is constant, then the omission of this variance will not be too important. If, however, as implied by Wass (1978), uncertainty has increased then some allowance will need to be made for this and adaptive regression techniques may give some guidance to the impact.

Role of political factors

One suggested reason for possible instability of reaction functions in the UK has been political influences mainly because it may be felt that different political parties may have different basic motives. Salmon and Wallis (1980) argue, however, that even then one may preserve the case for a constant structure by relating the role and motives of government to a uniform structure. This may, as these authors acknowledge, be harder to do in practice than in principle. Many attempts at estimating politico-economic reaction functions (e.g. McCrae, 1977, Alt, 1979) assume that each different government has its own weighting of the importance of the targets and constraints of economic policy. On the other hand, Frey and Schneider (1978) assume that the ideological differences do not affect relative weights although they have been criticised by Chrystal and Alt(1981) for this very fact. However, even though there exists some dispute about whether ideological differences affect the relationship between instruments and targets directly, there appears to be some consensus that political behaviour is not completely random but that it is systematically related to economic factors.

Flexibility in the setting of instruments

Some economic policy instruments are more flexible than others. For example, direct tax rates can in principle be changed whenever the Chancellor wishes but in practice any change requires substantial preparation by the Inland Revenue and this means that the principal time for taxation changes occurs in the annual Budget with changes at other times being exceptional. Direct tax changes, once announced, are therefore not easily reversed within a short period of time.

Changes in public expenditure are again possible at any time in principle, but in practice, require not only considerable preparation but also have proved very difficult to implement (see Blackaby, ed. 1978). Other potential instruments such as interest rates are much more flexible.

At first, though, incomes policy appears to come at the 'non-flexible'range of instruments, as in some cases it has required the formation of a special body and in this instance falls into the category of institutional change. However, these institutions can be abolished and then fairly promptly set up again (for example, the abolition of the NBPI in the early days of the Heath administration followed by the establishment of the pay board some 2-3 years later). The broad definition of incomes policy includes all forms of explicit and implicit policy pressure which makes it a more flexible policy instrument than first thought.

Lack of flexibility can occur for legal or constitutional reasons (such as the necessary approval of parliament or some enabling legislation or for cost reasons). To some extent cost factors can be included in the reaction function so that lack of flexibility of policy instruments on this account presents no inherent problem. If the problem is severe enough, then the cost of implementing the change in the instrument is justified. Lack of flexibility can in principle be incorporated by introducing lags of various lengths on the appropriate policy instruments.

7.5 Conclusions

This chapter has set out some of the problems involved in using policy reation functions. We have shown the similarities and differences between different approaches, using the Theil optimising framework as a base . We have also shown that most of the criticisms can be met by modification to this basic framework and that problems which are not soluble in these terms are probably not soluble for any class of policy reaction function since they imply that the underlying structure is unstable.

Notes to Chapter 7

1. It differs from the Tinbergen (1952) approach where the solution required an equal number of instruments and targets. The Theil approach does not require this assumption.

CHAPTER 8 EMPIRICAL ESTIMATION OF INCOMES POLICY REACTION FUNCTIONS

8.1 General background

In the previous chapter it was concluded that policy reaction could be endogenised in principle by extending and adapting the original Theil optimising framework. In general the approach is to maintain a consistent framework for policy whilst allowing for flexibility in the definition of the target variables and in the nature of the response of policy to changes in variables away from the desired outcome (e.g. a possible asymmetric response).

In estimation of the wage equation seasonally unadjusted data was used in order to avoid prior smoothing of the data. However when we consider policy formation it is apparent from the various descriptions of the last twenty years (e.g. Keegan and Pennant-Rea, 1979 and Blackaby, (ed.) 1978) that policy makers have based decisions upon seasonally adjusted data.[1] Consequently, the analysis of incomes policy in this chapter uses adjusted data. The discussion of the results begins with a description of the policy setting model assuming the independence of the setting of policy from the position of other policy instruments.

Earlier chapters have argued that use of on/off dummy variables to measure the pressure of incomes policy is inappropriate. Not only is the presence of policy pervasive over the period but simple on/off variables cannot hope to capture the variations in policy. One approach which has been used in the literature is that of Cragg (1971). This approach would lead to estimation of two separate equations. The first would determine the decision as to whether to impose policy and the second the extent of policy pressure. The first equation would then be similar to a 'tobit' model and the second would be an ordinary regression equation. An alternative to the two stage procedure is described by Maddala (1977). It is clear from the description of policy in Chapters 4 and 5 however that a superior approach can be used by quantifying policy in terms of real wage pressure and by assuming that policy is 'permanent' but merely applied to different extents. Thus policy is not only 'on' when it is formally announced but also can be applied implicitly. The description of the policy measure in Chapter 5 reveals that 'pure' policy off periods are then minimal and can be handled conveniently within the general framework.

In terms of the measures of policy developed in Chapter 5. the appropriate measure is IP3 which incorporates both the real wage pressure of policy (IP1) and government stringency(GPS). These were both seen in Chapter 6 to contribute significantly to the overall influence of policy or wage inflation. The overall influence of policy also included an effect from trade union response (TPS) and empirical estimates for the overall policy measure (IP4) are also presented.

Separate relationships for the stringency of policy (GPS) or for trade union response (TPS) were not estimated.[2] However, estimates are presented for three of the policy measures, IP1, IP3 and IP4. Given that IP3 is a less general version of IP4, it is possible to make inferences about the nature of the policy model.

In Chapter 7 it was argued that adaptive procedures could be used to allow for shifts in the underlying preference function or for changes in the authorities' view regarding the policy trade-offs. Alternatively such procedures could deal with growing <u>uncertainty</u> regarding the policy trade-offs.

Other issues raised in Chapter 7 concern the choice of the desired value of the policy instrument (X^* in the notation of Chapter 7); whether the target variables relate to past observed data or to expected future outcomes; the role of political factors; and flexibility in the setting of instruments. The first of these issues can be connected to the last since including the lagged value of X^* to measure the desired value of the instrument can be interpreted along the lines of policy inertia.[3]

The issue of flexibility of incomes policy as an instrument can perhaps be over-stated. Although the imposition of a formal policy backed by legislative sanctions and supported by some form of review body would inevitably imply some 'stability' in arrangements for policy and considerable costs in short-term changes in the stance of policy, this argument does not apply with equal force to incomes policy as broadly defined. In many ways incomes policy can be seen then as no less flexible than other policy instruments such as direct and indirect taxation and changes in public expenditure.

The issue of whether the appropriate formulation of the target variables should be in past or future expected outcomes is essentially an empirical issue. Most of the analysis concentrates on past values of the target variables but results are presented using genuine ex-ante forecasts of the target variables. A general expression of macroeconomic policy aims would probably include inflation, the level of unemployment and the rate of growth of output as the primary elements in the authorities' preference function. However, the last of these variables was consistently insignificant in the analysis and so is excluded from the results presented here. This is perhaps not surprising given the close relationship between cyclical changes in the rate of growth of output and the level of unemployment. Although the state of the balance of payments cannot perhaps be viewed as an ultimate target of policy it has clearly played a very significant role in the determination of policy over the period (see Chapter 4). Consequently it is included as one of the target variables either in the form of the current balance or in the wider concept of the change in reserves.

The relevance of political factors is in whether they exert an independent influence on policy. If political behaviour is systematically related to economic factors then it is not appropriate to regard these factors as independent exogenous factors.[4] Independent political factors which may, a priori, be relevant are the length of time that the political party has been in power and its ideological background. The reasons for the presence of the former measure is connected with the cycle of influence description of policy elaborated by Keegan and Pennant-Rea (1979) whereby the propensity to impose a tighter policy varies with the length of time in power. There may also be an argument that certain types of Government may be more likely to use incomes policy measures, *ceteris paribus*, although this description is not clear from the discussion of the development of policy in Chapter 4. Further, distinguishing between Labour and Conservative administrations by means of a dummy variable did not support the hypothesis that there is an effective ideological difference between the two parties. Neither did the length of period in power prove to be a significant influence.

8.2 Empirical estimates

Some empirical results from the policy equations are presented in Table 8.1. These estimates mainly refer to estimation by ordinary least squares for the period 1963(2) to 1979(2). However, there may be simultaneous bias present due to the possibility that some of the right-hand side variables (notably that relating to the inflation rate) are influenced in turn by policy stance. Estimates allowing for such influences are shown also and joint estimates of the wage, price and policy equations are given in Chapter 9, Table 9.1.

Several alternative measures of the unemployment level and the inflation rate are shown in Table 8.1 and many others were tested. The unemployment term is represented either by its lagged level, its deviation from a six-quarter moving average, and by its positive deviation from the moving average (both also lagged by one quarter). The unemployment *level* always proved superior to its rate of change whether in combination with the rate of change or as an alternative. The decision to use a moving average was made in order to incorporate the possible presence of moving targets or of changing uncertainty. Initially a longer moving average was chosen

Table 8.1 Incomes Policy Reaction Functions - OLS Estimates

Equation/	Policy variable	r_0	r_1	r_{21}	r_{22}	r_{23}	r_{31}	r_{32}	r_{33}	r_4	RSS	$\bar{R}^2$	RHO(1)	Durbin 'h'	$\chi^2_{(4)}$	$\chi^2_{(8)}$
(1)	IP3	-0.3648 (-1.3)	0.00026 (1.3)			-0.1864 (-0.6)			-0.0015 (-0.5)	0.7387** (7.1)	163.6	0.495	-	1.76		
(2)	IP3	0.4909 (1.0)	0.00033* (1.7)	-0.4138** (-3.7)			-0.00114* (-1.8)			0.7709** (8.1)	138.0	0.572	-	1.58	12.8	0.9
(3)	IP3	-0.1783 (-0.8)	0.00032* (1.8)		-0.5591** (-4.2)			-0.0055** (-2.6)		0.7778** (8.8)	127.0	0.607	-	0.69	11.1	2.3
(4)	IP3	0.0382 (0.1)	0.00024 (1.3)	-0.4886** (-3.8)					-0.0071** (-2.4)	0.7563** (8.1)	132.8	0.590	-	1.12		
(5)	IP1	1.1018 (1.1)	0.00032 (1.1)	-0.7970** (-3.9)			-0.00222* (-1.8)			0.6907** (6.9)	263.3	0.708	0.329** (2.8)	-		
(6)	IP1	-0.2490 (-0.6)	0.00033 (1.2)		-0.9176** (-4.3)			-0.00845* (-2.2)		0.7452** (8.2)	256.7	0.715	0.251** (2.1)	-		
(7)	IP1	-0.1889 (-0.5)	0.00027 (1.0)	-0.8771** (-4.2)				-0.00821** (-2.1)		0.7408** (8.0)	259.7	0.712	0.275** (2.3)	-		
(8)	IP1	0.1810 (0.4)	0.00032 (1.2)		-0.9654** (-4.6)				-0.01315** (-2.6)	0.7339** (8.2)	250.2	0.722	0.202* (1.7)	-		
(9)	IP4	0.5362 (1.0)	0.00026 (1.5)	-0.5290** (-4.5)			-0.00115* (-1.7)			0.7756** (8.0)	91.3	0.725	0.264** (2.2)	-		
(10)	IP4	-0.1677 (-0.7)	0.00025* (1.6)		-0.6274** (-5.3)			-0.00639** (-2.9)		0.7688** (8.7)	84.1	0.746	0.206* (1.7)	-		
(11)	IP4	-0.0906 (-0.4)	0.00022 (1.4)	-0.6063** (-5.3)				-0.0609** (-2.9)		0.7900** (9.0)	84.3	0.746	0.186 (1.5)	-		
(12)	IP4	0.1228 (0.5)	0.00023 (1.5)		-0.6585** (-5.6)				-0.00983** (-3.4)	0.7409** (8.4)	81.1	0.756	0.158 (1.3)	-		

General equation: $IP_i = r_0 + r_1\, DRSVS_t + r_{21}P^*_{1,t} + r_{22}P^*_{2,t} + r_{23}P^*_{3,t} + r_{31}U^*_{1,t-1}$

$+ r_{32}U^*_{2,t-1} + r_{33}U^*_{3,t-1} + r_4 IP_{i,t-1}$

Notes: DRSVS is the price deflated change in foreign reserves.

U^* is unemployment measured as either the level of unemployment (U^*_1); the deviation of unemployment from a 6-quarter moving average (U^*_2); or the positive deviation of unemployment from a 6-quarter moving average (U^*_3)

P^* is the annual inflation rate: measured as either the <u>change</u> in the inflation rate (P^*_1); the deviation of the inflation rate from a 6-quarter moving average (P^*_2); or the positive deviation of the infation rate from a 6-quarter moving average (P^*_3).

(12 quarters) to reflect the average length of the economic cycle but the results indicated a superior performance from the equation using the shorter reference period. Application of the piecewise approach is given by defining the unemployment deviation term to operate only when it is positive so that the authorities react asymmetrically to increases and declines in the level of unemployment.[5] Among alternatives tested but rejected was the cumulative deviation of unemployment from its moving average level. This tests whether the persistence of a gap between a target variable and its desired level is necessary before any change in policy pressure occurs. However,this variable always proved insignificant.

The inflation variable is defined in a similar way to that for unemployment except that it was found that it was the change in the inflation rate or the change in its deviation from its moving average that was relevant. Other alternatives tested were identical to those for unemployment.

The change in foreign reserves (deflated to constant price terms) was used to reflect the balance of payments constraint. From the description of economic policy in Chapter 4 it appears that this is the appropriate variable rather than alternatives such as the current balance of payments.

As mentioned earlier one of the economic goals omitted from the incomes policy equation is the rate of growth of GDP. The general insignificance of such a variable may be related to the fact that although the authorities have often justified a tightening of incomes policy pressure by the desire to increase the rate of economic growth the target rate of growth has often been vague and ill-defined. An alternative interpretation of this result is that the primary influences on incomes policy have been the inflation-unemployment trade-off and that it is through changes in this trade-off that higher economic growth was to ensue.

The equations described in Table 8.1 all assume the independence of the setting of the incomes policy instrument from other economic policy instruments. However, on several occasions policy instruments have been used either as substitutes for one another or complements.[6] Issues regarding the joint setting of policy instruments are discussed later in this Chapter but in order to use a proxy for the general fiscal stance of policy the actual financial deficit and the weighted full-employment budget deficit were used following the example of Nobay (1974).[7] However, neither proved statistically significant and we cannot reject the hypothesis that changes in incomes policy are unrelated to the overall fiscal stance. A priori, the sign on the change in reserves is expected to be positive whereas one would expect a worsening of inflation or unemployment to be associated with an increase in policy pressure and therefore a negative coefficient on these variables. The results in Table 8.1 indicate a uniformity with these expectations.

Consider first the results relating to the incomes policy measure, IP1 (equations (5) to (8)). The unemployment variable is always statistically significant but is least significant when in straight level form. The inflation term is always highly significant but there is little to choose between its measurement as the change in the actual inflation rate or in the change in the deviation of the inflation rate from its moving average. The change in foreign reserves variable is correctly signed but never statistically significant. The size of the coefficient on the lagged dependent variable is quite high and implies considerable policy inertia. First order serial correlation coefficent of the residuals exists and the serial correlation is of the order of 0.2 to 0.3. Overall the equation fits the data tolerably well and there is little to choose between any of the particular specifications, except that the version (equation (8)) which measures the unemployment as its positive deviation from the moving average, and the inflation variable as the change in the deviation from the moving average, peforms slightly better. Here possible specification errors (as indicated by the presence of first-order serial correlation) are less apparent than for the other versions of this equation.[8] The size of the coefficients in the inflation term indicate almost a 1:1 short-run relationship between changes in the inflation rate, or in its deviations from the moving average, and the incomes policy measure with a considerably larger effect in the longer run.

The results relating to incomes policy measure IP3 seem to indicate a weaker overall performance as measured by $\bar{R}^2$, but there is less evidence of specification errors due to the presence of serial correlation as this is conclusively rejected by the joint-test of serial correlation up to the eighth order. The change in reserves is now more significant and the unemployment and inflation coefficients are lower. However, the variation in IP3 is considerably less than that of IP1 so that this does not imply a lower policy effect. The lagged dependent variable continues to be large in magnitude and highly significant as the 5 per cent level. As with the equations based on IP1 there appears to be a case for preferring versions where the unemployment variable is measured in deviation form although the same cannot be said about the inflation measure.

Equations based on the more comprehensive measure of policy (IP4) provide a higher degree of fit than those for IP1 and IP3.[9] The presence of specification errors as indicated by serial correlation of the residuals is less obvious when the dependent variable is IP4, unless the unemployment variable is measured in non-deviation form. Both the unemployment and inflation variables are significant but the reserves variable is not.

A slight improvement in performance occurs when only the positive deviation of unemployment from its moving average is used signifying that the authorities react asymmetrically to changes in unemployment and that only increases in unemployment about its target are relevant to policy decisions. When the unemployment term is decomposed into positive and negative deviations only the positive term was statistically significant but the hypothesis that the coefficients on positive and negative components were equal could not be rejected.[10]

Versions of equation (2) and (3) were also estimated recursively in order to assess the validity of the moving average procedure and more generally to test the constancy of the parameter values. Recursive estimation of equation (2) gave a mean value for the innovations of 0.027 with a t-value of 0.18 and a modified Portmanteau statistic of 13.7 (for 13 degrees of freedom).[11] Estimation of equation (3) where both variables are expressed in deviation form gave a mean innovation value of -0.22 with a t-value of 1.11 and a modified Portmanteau statistic of 9.3.[12] Thus the equations adopted appear to be a reasonable approximation to the data over the sample period although ex-post sample stability is marginal given the values of the $\chi^2_{(4)}$ statistics reported in Table 8.1.

Table 8.2 Influences of Unemployment and Inflation on Incomes Policy

Beta coefficients[a]

Equation	Unemployment Short-run	Unemployment Long-run	Inflation Short-run	Inflation Long-run	Reserves Short-run	Reserves Long-run
(2)	-0.165	-0.721	-0.291	-1.270	0.147	0.643
(3)	-0.317	-1.428	-0.463	-2.082	0.147	0.643
(4)	-0.307	-1.259	-0.343	-1.409	0.107	0.440
(5)	-0.193	-0.625	-0.337	-1.089	0.086	0.278
(6)	-0.293	-1.150	-0.456	-1.791	0.086	0.348
(7)	-0.285	-1.099	-0.371	-1.430	0.072	0.280
(8)	-0.342	-1.284	-0.480	-1.805	0.147	0.323
(9)	-0.153	-0.684	-0.342	-1.526	0.107	0.476
(10)	-0.339	-1.455	-0.478	-2.049	0.103	0.460
(11)	-0.323	-1.540	-0.392	-1.869	0.082	0.431
(12)	-0.391	-1.862	-0.502	-2.388	0.095	0.365

Note:

(a) Beta coefficients are the estimated slope parameters adjusted by the ratio of the standard deviation of the independent variable to the standard deviation of the dependent variable. See Pindyck and Rubinfeld, 1976, p.71.

Table 8.2 shows the contributions of unemployment, inflation and the change in reserves to incomes policy using the regression estimates from Table 8.1. Since both dependent and independent variables differ in order of magnitude the regression coefficients are normalised by their respective standard deviations. The coefficients in the table are then to be interpreted as showing the effect of a one standard deviation change in one of the independent variables in terms of a standard deviation of the dependent variable. Thus taking equation (2) a 1 standard deviation change in the level of unemployment will lead to a -0.165 standard deviation change in IP3 in the short-run and -0.721 in the long-run. One can now compare effects across equations and it is apparent that the inflation effects are uniformly greater than those of unemployment. The unemployment effects themselves increase in magnitude when expressed in deviation form and increase even more when only the positive deviation is considered (e.g. compare equation (8) with (6)). On the other hand the inflation effects decrease when the deviation measure is used. Moving from equations using IP1 to IP3 to IP4 reveals a greater proportionate effect for both inflation and unemployment but not for the change in reserves.

The lag structure of the equation typically implies that one-quarter of the total adjustment occurs in the current period, nearly two-thirds within one year and just under 90 per cent within two years. The range of the mean lag varies between 2 and 4 quarters.

8.3 Expectations

The estimates of the policy reaction functions described thus far use observed current or past values of the policy target variables as determinants of the income policy decision. Whilst past information about the economic system may not be optimal in terms of policy decisions it is possible that the authorities attach a greater certainty value to past or current data than to conditional forecasts. Indeed many of the accounts of economic policy formation over the period (e.g. Blackaby (ed.), 1978) emphasise the reaction of the authorities to events rather than their anticipation of future problems.

In order to test the backward versus forward looking approaches it is necessary to have information either about the authorities' decision process or on expected values of the target variables themselves. Many alternatives offer themselves under the former option, ranging from time series projections to use of the authorities' own model of the economy.[13] The overall policy model cannot be tested independently of the expectation generating process and so the second method is used here. Only very recently have the authorities produced conditional forecasts of the economy but the National Institute of Economic and Social Research have done so regularly since 1961. For a long time the National Institute was regarded as a "Treasury in exile" and its projections have often been taken as a guide to the official view of the economy. By taking the successive forecasts of the current balance of payments, the inflation rate and the growth of output[14] a set of genuine ex-ante variables can be formed.

However the results are disappointing(see Table 8.3) with the expected sign on the forecast balance of payments but statistically insignificant although the coefficient on expected inflation is of the expected sign and statistically significant. The coefficient on the forecast growth rate is positive

Table 8.3 Incomes Policy Reaction Functions - Further Results [a]

Method and notes	r_0	r_1	r_{21}	r_{32}	r_4	RSS	$\bar{R}^2$	Durbin 'h'
(13) OLS: Forecast values [b]	0.1992 (0.4)	0.40E-04 (0.2)	-0.1217** (-2.5)	0.0575 (0.6)	0.6461** (7.4)	112.1	0.641	3.96**
(14) IV: [c]	-0.0428 (-0.2)	0.00028* (1.8)	-0.5258** (-3.2)	-0.0049** (-2.4)	0.8519** (11.0)	87.0	0.744	1.64

Notes: (a) See Table 8.1 for general notes

(b) Uses NIESR forecasts of the current balance of payments for the change in reserves; inflation for P* and output growth for U*; all these variables are lagged by one quarter.

(c) U* is the deviation of unemployment from its moving average (U^*_2); P* is the change in the inflation rate (P^*_1); instruments are lagged values of exogenous and endogenous variables, output growth and world prices. P* is taken to be endogenous.

and insignificant and the overall performance of the equation is substantially inferior to the formulation using past or current values of the policy targets.

8.4 Simultaneity of policy setting and comparison with other instruments

The estimates of the policy reaction functions in Table 8.1 all assume that the independent variables are exogenous to the policy decision and that the choice of incomes policy stance is independent of the setting of other instruments. In Table 8.3 equation (11) is re-estimated by using instruments for the change in the inflation rate since any significant policy effect through wages is likely to influence this variable. The instruments chosen are lagged values of endogenous and exogenous variables, foreign prices and output growth. The results are shown in equation (14) in Table 8.3. The reserves variable now becomes marginally significant whilst the coefficients on the unemployment and inflation variables decline a little. The value of the Durbin 'h' statistics suggests some first order serial correlation of the residuals in which case the use of the lagged endogenous variables as instruments would be invalid. Further allowance for price simultaneity is made in Chapter 9 where the wage and policy equations are jointly estimated with a price equation.

Estimates for other policy instruments are given in Table 8.4 The other policy instruments chosen for comparison are hire purchase controls; the standard rate of tax; personal tax allowance; the short term interest rate; public expenditure and the indirect tax rate. Both the direct and indirect tax rate have been changed very irregularly over the period and the continuous model applied to these instruments does not therefore yield particularly convincing estimates. The equation for the other instruments were more satisfactory. For hire-purchase controls the change in reserves is marginally significant and implies that an increase in reserves lowers the degree of controls and increases in unemployment and output growth would also lower the extent of controls. These variables are statistically significant as is the inflation variable. The lagged value of hire purchase controls has a negative coefficient reflecting the temporary nature of controls. None of the other policy instruments has a significant effect on the setting of hire-purchase controls.

The interest rate equation has a significant reserve term but insignificant inflation and unemployment effects whilst public expenditure growth is only significantly related to its past value.

The incomes policy equation is also shown in the table and has considerably higher explanatory power than the equations for the other policy instruments. Incomes policy is significantly related to some of the other policy instruments with higher interest rates associated with greater policy pressure and higher tax allowances associated with lower pressure. Finally, the incomes policy, h.p. and interest rate equations are estimated simultaneously using 3SLS. The results, shown in Table 8.4 are very close to the OLS estimates and suggest that case for arguing that policy instruments are set together rather than one at a time is weak. H.P. controls appear to be a substitute for incomes policy however, although the presence of other policy variables in the incomes policy equation qualifies this result. In addition, it should be recognised that some of the equations explaining changes in the other policy instruments are

Table 8.4 Policy Instruments Compared
Estimation 1963(2)-1979(2)

Dependent variable	a_0	a_1	a_2	a_3	a_4	a_5	a_6	a_7	a_8	a_9	RSS	$\bar{R}^2$	Durbin 'h'
OLS estimates													
Change in hire purchase controls[a]	13.323** (2.0)	-0.0013* (-1.7)	-1.976* (-1.9)	-0.0352** (-3.0)	-1.1519** (-2.9)	-0.1700** (-2.5)		-0.0113 (-1.3)	0.6189 (1.1)	-0.6995 (-1.4)	2336.3	0.222	-1.42
Change in standard rate of tax[b]	0.1399** (4.1)	0.5E-06 (0.3)	0.95E-03 (0.7)	0.38E-04* (1.7)	-0.82E-03 (-1.0)	-0.4297** (-4.1)					0.0114	0.178	-1.58
Change in personal tax allowances[c]	11.165 (1.5)	0.0013* (1.7)	-0.9271 (-1.4)	-0.0060 (-0.5)	-0.065 (-0.2)	-0.0124 (-1.2)	-0.0867 (-1.2)		0.4379 (0.7)	0.3252 (0.7)	2259.5	0.05	n.a.
Change in interest rate[d]	-0.403 (-0.4)	-0.60E-03** (-6.0)	-0.1008 (-1.1)	-0.0022 (-1.5)	-0.0201 (-0.4)	-0.1077 (-1.3)	-0.0061 (-0.6)	0.0019 (1.6)		-0.0652 (-1.0)	39.4	0.408	0.49
Change in public expenditure[e]	0.6030 (1.5)	0.51E-04 (0.2)	0.2233 (1.4)	0.0026 (0.9)	-0.00067 (-0.1)	0.6895** (6.9)					182.8	0.488	-0.68
Change in indirect tax rate[f]	0.0031 (0.8)	-0.20E-06 (-0.3)	-0.91E-03* (-1.9)	-0.11E-04 (-1.4)	-0.29E-03 (-1.0)	-0.020 (-0.6)					0.0015	0.01	-0.97
Incomes policy[g,h]	-2.055* (-1.8)	0.00013 (0.8)	-0.4510** (-4.0)	-0.0057** (-2.3)		0.7665 (8.4)	0.0192 (1.6)	0.0043** (2.8)	-0.2778** (-2.9)		73.1	0.774	1.82*
Incomes policy[g]	-2.180** (-2.0)	0.00015 (1.0)	-0.4612** (-4.2)	-0.0046** (-2.6)		0.7859** (9.0)	0.0261** (2.2)	0.0042** (2.8)	-0.2939** (-3.2)		71.3	0.783	1.72*
3SLS estimates													
Incomes policy[i]	-2.3927** (-2.1)	0.00018 (1.1)	-0.4231** (-2.3)	-0.0043** (-2.3)		0.8000** (8.3)	0.0307** (2.4)	0.0041** (2.3)	-0.2763** (-2.1)		72.1	0.777	1.30
H.P. controls[i]	17.453** (2.5)	-0.0012 (-1.3)	-2.441** (-2.4)	-0.0047** (-3.6)	-1.3275** (-3.4)	-0.1938** (-2.8)		-0.0200* (-1.8)	1.2525 (1.5)	-0.6556 (-0.9)	2519.1	0.191	-0.72
Interest rate[i]	0.6540 (0.5)	-0.615E-03** (-5.3)	-0.2968 (-1.6)	-0.0024 (-1.2)	-0.0394 (-0.7)	0.1951 (1.2)	-0.0254* (-1.7)	-0.8E-03 (-0.4)		0.2115 (1.6)	56.9	0.144	0.12

General equation: $INST_i^k = a_0 + a_1\,DRSVS + a_2 P_1^* + a_3 U_2^* + a_4 Y + a_5 INST_{t-1} + a_6 HP + a_7 ALL + a_8 TB + a_9 IP4$

Notes: see Table 8.1 for general notes.

(a) Hire purchase controls (HP) measured as d + (100-d)/m where d = minimum deposit, m = maximum repayment period : Source: Blackaby (ed.) 1978; <u>NIER</u> various
(b) % points
(c) Married person's allowance deflated by price index (ALL): % change — Source: Blackaby (ed.) 1978; <u>Financial Statement and Budget Report</u>
(d) Bank rate/Treasury bill rate (TB)
(e) Current expenditure on goods and services (£m.75 prices): % increase over same quarter in previous year
(d)–(e) Source: <u>Economic Trends Annual Supplement</u>
(f) Purchase tax/VAT rate
(g) Policy measure (IP4)
(h) Uses positive deviation of unemployment
(i) Instruments include lagged variables, foreign prices and output growth
(j) Y is the change in GDP
(k) INST is the policy variable

quite weak.

8.5 Summary and conclusions

The empirical estimates of this section show that the stance of incomes policy is sensitive to changes in unemployment and inflation although there is a considerable degree of inertia in policy. The evidence suggests that the authorities have adopted, for whatever reasons, an implicit moving target for unemployment and that they may have responded asymmetrically to changes in unemployment about this moving target level with a greater response to increases in unemployment than to decreases. The results also show that it is the change in the inflation rate that is relevant for incomes policy rather than the inflation rate itself.

The results also suggest that there is not a great deal of simultaneity between policy instruments although incomes policy stance does appear to be negatively related to interest rates and positively to tax allowances suggesting some weak complementarity of policy.

The estimated incomes policy equation performs better than many of the comparable equations for the other main policy instruments although this finding needs to be qualified by the fact that all the equations were estimated using an identical specification.

Notes to Chapter 8

1. In the following chapter where the complete model is estimated comparable equations are based on seasonally unadjusted data.

2. Some work attempting to explain TPS found some sensitivity to real wages but the results were in general inconclusive.

3. Although the cost of adjustment formulation would also suggest the inclusion of the lagged value of the policy instrument.

4. The debate over political factors is summarised briefly in Chapter 7. This debate appears, as yet, to be unresolved.

5. In this case it is implied that there is no reaction at all to an easing of unemployment below its moving average level.

6. For example, the tightening of incomes policy in late 1966 was complemented by restrictive fiscal measures whereas that of 1975 was presented as an alternative to more vigorous fiscal and monetary measures.

7. See Chapter 4 for a discussion of these fiscal measures.

8. Inclusion of additional lagged values of the unemployment and inflation terms did not remove the serial correlation.

9. But since the dependent variables differ and thus also the original sum of squares this statistic cannot be used to determine both the choice of specification <u>and</u> the choice of dependent variable.

10. The F ratio is 0.71 against a critical value of 4.0.

11. The main outliers were observed for 1966Q3, 1975Q1, 1968Q1, 1970Q3, and 1972Q4.

12. Here the main outliers were for 1967Q1, 1974Q3 and 1975Q3.

13. However, on several occasions the authorities have taken actions clearly inconsistent with the predictions of their own model, e.g. the Conservative Government of 1979-80.

14. Continuous forecasts of unemployment are not available.

CHAPTER 9 THE COMPLETE MODEL

9.1 Introduction

Chapter 5 described the measurement of the quantitative incomes policy variable whilst Chapter 6 used the resultant policy variables as part of an estimated real wage resistance equation and Chapter 8 attempted to explain the variations in incomes policy pressure by movements in the main targets of economic policy. In the first section of this chapter, estimates of the joint model of wages and policy are presented, together with the linking price relationship. The wage equation already contains estimates of pre-announced policy effects and in Section 9.1 further discussion of more general anticipation effects is given.

The chapter examines the difference between the results given here and those given by the empirical literature. The role of simultaneity bias is also examined as is the nature of the form of policy within the wage equation and the chapter presents an account of the contribution of incomes policy to wage inflation over the period.[1] The final section of the chapter examines the implications of the estimated model by analysing its simulation properties.

The wage equation is given by either (9.1) or (9.2):

$$\begin{aligned}\Delta \log W = b_0 &+ b_1 \log U_{t-1} + b_3 \log (rW/P)_{t-1} + b_3 \Delta \log P \\ &+ b_4\, TIME + b_5 \log (1 + IP4/100) + b_6 \log (1 + DLPA/100) \\ &+ b_7 \log(1 + CATCH/100) + \text{seasonal dummies} \qquad (9.1)\end{aligned}$$

$$\Delta \log W = e_0(1-\gamma IPS_t) + e_1 (1-\gamma IPS_t)\log U_t + e_2 (1-\gamma IPS_t)\log({}^{rW}/P)_{t-1}$$

$$+ e_3(1-\gamma IPS_t)\log \Delta P_t + e_4 (1-\gamma IPS_t)TIME$$

$$+\gamma IPS\ (1+IP1/_{100}) + e_5 \log(1+DLPA/_{100}) + e_6 \log(1+ CATCH/_{100})$$

$$+ \text{seasonal dummies} \qquad (9.2)$$

where U refers to unemployment; W to wages; P to prices, r to the retention ratio; IP4 to the overall measure of incomes policy; DLPA to anticipation/announcement effects; CATCH to the catch-up effects from policy; IP1 to the real wage pressure of policy; and IPS to the intensity of policy.[2] Chapter 6 refers to (9.1) as the unrestricted model where the incomes policy variable enters as

separate variable and (9.2) as the restricted model when the policy effects enter both separately, and jointly with the other variables, through the intensity of policy.

The price equation is given by (9.3)

$$P = c_0 + c_1 WC + c_2 TAX + c_3 PM + c_4 P_{t-1} + \text{seasonal dummies} \qquad (9.3)$$

where WC refers to unit wage costs ($WC = {}^{W.E}/O$); TAX to unit indirect taxes and PM to the price of imports.

The policy equation is given by (9.4):

$$IP4 = r_0 + r_1 DRSVS + r_2 P^* + r_3 U^*_{t-1} + r_4 IP4_{t-1} + \text{seasonal dummies}$$

where DRSVS is the price deflated change in foreign reserves; and P* and U* are appropriate measures of inflation and unemployment (see Chapter 8).

Table 9.1 Joint Estimates of the Wage, Price and Policy Equation

	wage equation											
	restricted model	e_0	e_1	e_2	e_3	e_4	γ	e_5	e_6	RSS	D.W./ Durbin 'h'	$\bar{R}^2$
(1)	unseemingly related regressions[a]	0.3028** (3.2)	-0.0168** (-1.7)	-0.1825** (-2.8)	1.0†	0.00116** (2.5)	0.1886** (3.4)	2.0599 (1.4)	1.8755** (2.0)	0.01917	1.98/..	0.354
(2)	3SLS[a]	0.2943** (3.0)	-0.0153 (-1.5)	-0.1805** (-2.7)	1.0†	0.00110** (2.4)	0.1615** (2.5)	2.0467 (1.4)	1.7577* (1.8)	0.01927	1.96/..	0.351
	unrestricted model	b_0	b_1	b_2	b_3	b_4	b_5	b_6	b_7			
(3)	3SLS[b]	0.2442** (2.8)	-0.0105 (-1.1)	-0.1571** (-2.7)	1.0†	0.00090** (2.2)	0.2575** (2.8)	1.8345 (1.2)	2.0726** (2.1)	0.01977	2.05/..	0.335
(4)	3SLS[c]	0.2380 (2.8)	-0.0107 (-1.1)	-0.1504** (-2.5)	1.0†	0.00087** (2.1)	0.2501** (2.8)	1.8581 (1.2)	2.0871** (2.1)	0.01977	2.06/..	0.335
	policy equation	r_0	r_1	r_2	r_3	r_4						
(1)	IP4[a]	0.0985 (0.2)	0.0197 (1.4)	-0.1107** (-3.5)	0.874E-04 (0.2)	0.7144** (9.2)				94.34	1.49/2.4**	0.748
(2)	IP4[a]	0.1569 (0.3)	0.0213 (0.7)	-0.1286** (-3.5)	0.00018 (0.3)	0.6955** (6.3)				95.04	1.45/2.5**	0.746
(3)	IP4[b]	-0.4316 (-1.4)	0.0180 (1.2)	-0.4284** (-3.1)	-0.0066** (-3.5)	0.8806** (10.6)				99.70	1.90/0.6	0.739
(4)	IP4[c]	-0.1607 (-0.5)	0.0011 (0.8)	-0.4192** (-3.3)	-0.0086** (-3.5)	0.8551** (10.4)				94.26	1.91/0.5	0.748
	price equation[d]	c_0	c_1	c_2	c_3	c_4						
(3)		-1.600** (-5.5)	37.855** (8.6)	30.713** (3.4)	0.0952** (3.9)	0.6880** (17.6)				45.04	1.88/1.49	0.992

Notes:
(a) In the policy equation inflation is defined as the lagged inflation rate and unemployment as the lagged level of unemployment
(b) In the policy equation inflation is defined as the change in the inflation rate and unemployment as the lagged deviation of unemployment from a 6-quarter moving average
(c) In the policy equation inflation is defined as the change in the inflation rate and unemployment as the lagged positive deviation of unemployment from a 6-quarter moving average
(d) Only one price equation is shown here. The properties of the other price equations are very similar

Instruments used in the models are lagged values, and foreign prices. See Appendix E for seasonal dummies.

9.2 Empirical estimates

In Table 9.1 joint estimates of the wage, price and policy equation are given. In equation (1) the restricted wage model is estimated along with the price equation (described in Chapter 6) and a policy equation by assuming that they are a set of seemingly unrelated regressions.[3] Equation (2) re-estimates the same set of equations by three-stage least squares (3SLS) and equation (3) also estimates the system by 3SLS but using the unrestricted wage model of Chapter 6.[4] In the restricted model incomes policy enters the equation in two ways, by modifying the coefficients by the stance of policy (IPS) and by entering as a separate variable (IP1) whilst in the unrestricted model policy merely enters as an additional variable. When the two models were compared in Chapter 6 there was little to choose in explanatory power between them. In Chapter 6 it was concluded that, for the unrestricted model, as one moved from OLS estimation to IV estimation the inflation coefficient increased in size and became insignificantly different from unity whilst the policy coefficient decreased only a little in size and also became less statistically significant. Treating the wage and price equations as a set of unseemingly related regressions further reduced the size of the policy coefficient but not its significance. Although the same conclusion can be made regarding the restricted model and the inflation variable, there is no downward revision to the direct policy coefficient as either simultaneity or contemporaneous cross-equation error correlation is allowed for. However the lagged real wage variable does increase in size and significance.

Comparing the equations in Table 6.4 with (1) and (2) in Table 9.1 shows the impact of including an equation for policy formation. Equation (1) in Table 9.1 is directly comparable with equation (23) in Table 6.4[5]. Most of the changes in the estimated coeficients are small but of note are the slower rate of adjustment in the real wage gap and a slightly smaller direct policy coefficient. The policy catch-up term now becomes statistically significant. When simultaneity and error correlation are combined (3SLS) the policy coefficient is reduced and is now comparable in size to that estimated by IV in Table 6.4 (equation (21)).

As was the case when comparisons were made on the basis of OLS and IV estimation is Chapter 6 there is little to choose between the restricted and unrestricted wage models, with the unrestricted model explaining wage inflation at least as well as the more complex restricted model[6] Allowing for simultaneity leads to an inflation coefficient in the unrestricted model which is not statistically different from unity. The policy coefficient is of the order of 0.25 implying a substantial leakage on average from incomes policy. The unemployment variable in equation (3) is of the expected sign but is insignificant. The standard real wage catch-up mechanism implies that just over 15 per cent of any discrepancy between real wages and its trend is made up within the quarter with an annual growth rate of 2¼ per cent in the desired value of real post-tax wages.[7] The prior announcement variable has the expected sign but is not statistically significant. The policy catch-up effect is positive and significant implying that for each 1 per cent easing of policy pressure nominal wages grow by 2 per cent. The policy equation corresponding to equation (3) explains policy by the change in the inflation rate and the deviation of unemployment from its moving average. The equation implies a strong degree of inertia with a value for the coefficient of the lagged dependent variable of 0.88. Both inflation and unemployment are significant and of the expected sign. A 1 per cent <u>change</u> in the rate of price inflation produces a ½ per cent increase in policy pressure (i.e. a lower value for IP4).

In order to properly assess the relative contributions of the variables beta coefficients are presented for the impact effects of variables in the wage and policy equations in Table 9.2. Thus it can be seen that, for the wage equation, inflation and real wages have by far the greatest impact (each 1 standard deviation in prices leads to a change of 0.77 standard deviations in wages) with the policy effect the next most important variable. Incomes policy catch-up effects are comparable in effect to unemployment though with a different direction of effect. For the policy equation inflation and unemployment are equally important with each 1 standard deviation change in either U* or P* leading to just over ½ standard deviation change in the policy variable.

Although these estimates are calculated allowing for simultaneity between wages and policy the full flavour of changes in variables when the effects are allowed to work through the sub-system are given by the simulation analysis of section 9.3.

<u>Expectation effects</u>

The role of price expectations and pre-announced policy changes were incorporated into the wage model in Chapter 6 where there was some discussion regarding the more general expectational elements of policy. There it was stressed that it is not possible to test

Table 9.2 **Beta Coefficients for the Complete Model**

Impact coefficients for model (3)

Wage equation

Unemployment	Inflation	Lagged real wages	Policy	Announcement	Catch-up
-0.19	0.77	-0.73	0.28	0.10	0.18

Policy equation

Change in reserves	Inflation	Unemployment
0.08	-0.27	-0.29

See Table 8.3 for details of the construction of the beta coeffient.

expectation-generating mechanisms directly. It was also argued that a non-rational expectations mechanism was more plausible. Several alternative expectations generating mechanisms were experimented with to derive a role for expected policy changes. Underlying them all was the assumption that expectations of policy changes would only lead to timing changes. In Chapter 6 the empirical estimates of pre-announced policy changes supported the hypothesis that the timing effect was only spread over two quarters with equal and opposite signs in each period. This restriction was also placed on some of the expectations generating mechanisms. None of the expectations systems proved a useful adjunct to the main wage model and only one is described here. In this version policy expectations are determined by the stance of policy in the previous period, the change in the pace of price inflation and the length of time since the last general election. This expectations formation thus incorporates both political elements (since policy pressure might be expected to ease close to an election) and elements of the estimated actual policy reaction function which includes the inflation term and lagged policy effects.

Thus if $IP^e_t = \alpha_0 IP_{t-1} + \alpha_1 NQEL - \alpha_2 \Delta\dot{P}_t$

(so that the nearer an election (the higher NQEL) the less restrictive expected policy, and the greater the change in pace of price inflation the more restrictive expected policy) the restriction that $IP^e_{t+1} = IP^e_t$ produces the expectations variable:

$$DIP_t^e = -\alpha_0(IP_{t-1} + IP_{t-2})$$

$$-\alpha_1(NQEL + NQEL_{t-1})$$

$$+\alpha_2(\Delta\dot{P}_t + \Delta\dot{P}_{t-1})$$

Although the variables have the expected sign, none is statistically significant. The negative results of this exercise are not conclusive however and merely illustrate the difficulty of modelling expectation effects in economics.

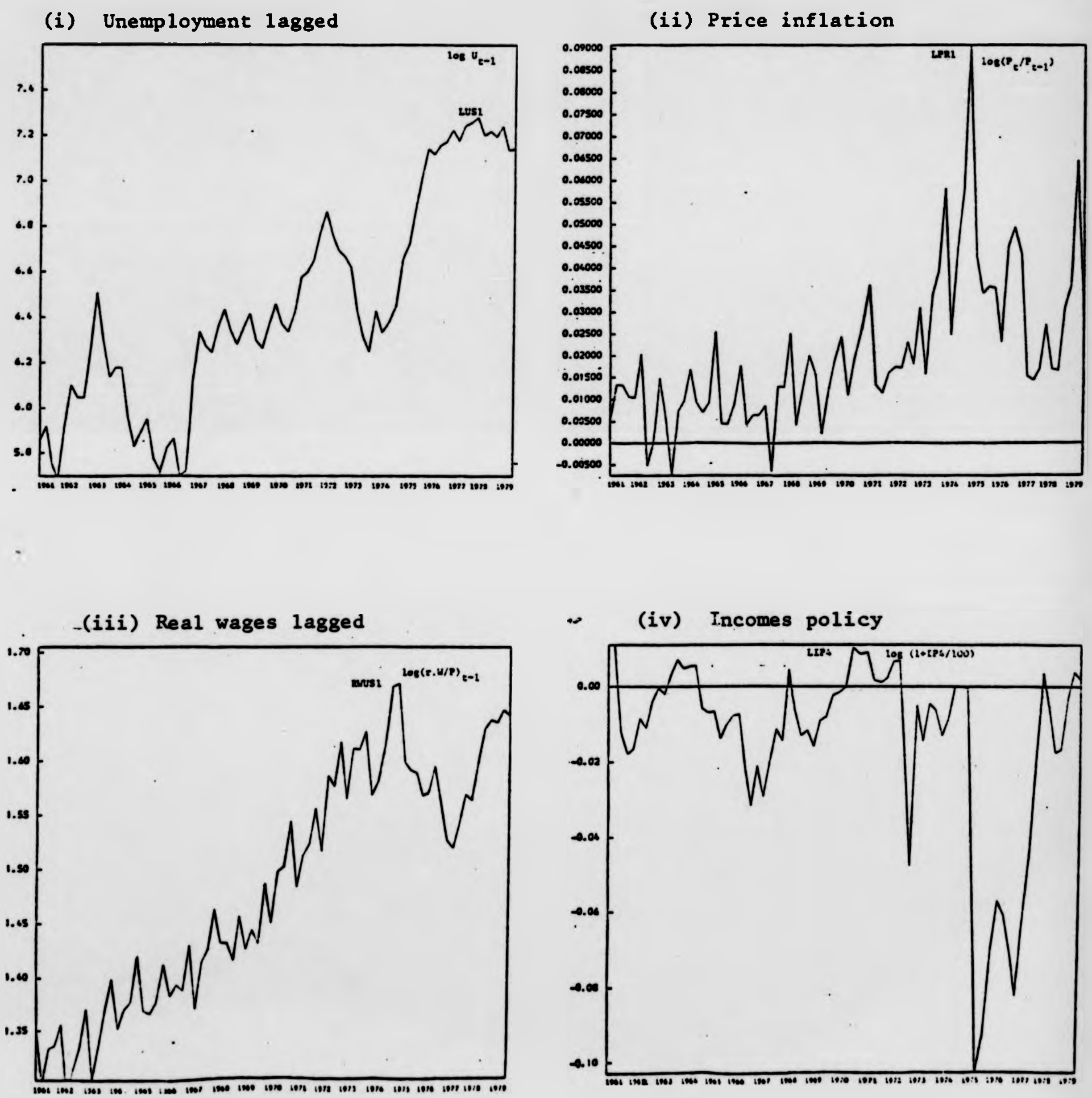
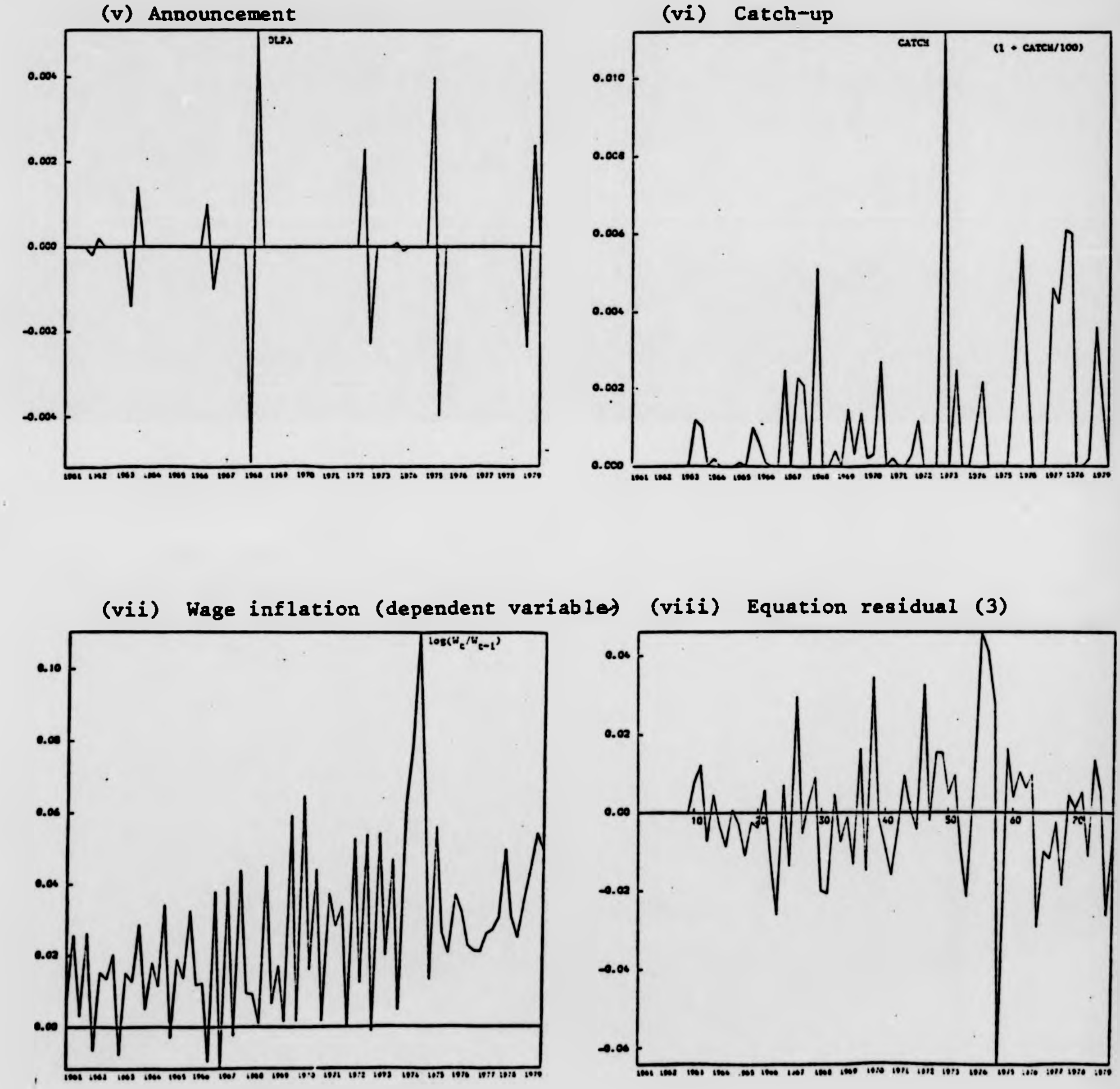


Figure 9.1 **Variables in the Wage Equation**

Figure 9.1 Variables in the Wage Equation (cont'd.)



(v) Announcement

(vi) Catch-up

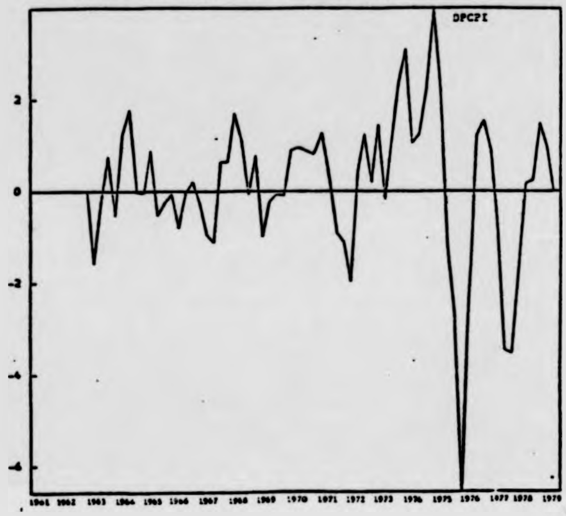
(vii) Wage inflation (dependent variable)

(viii) Equation residual (3)

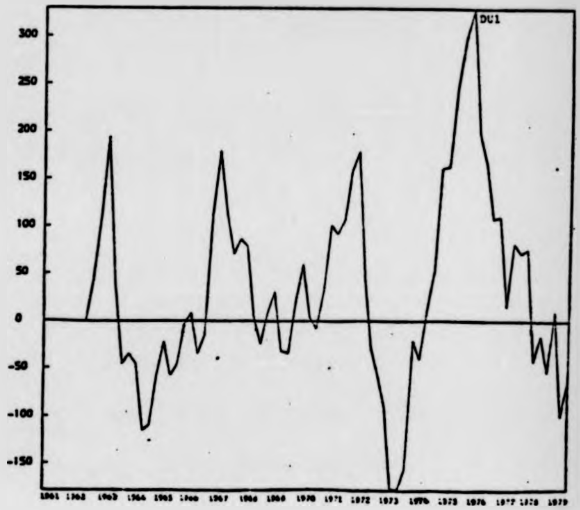
Note: For definition of variables see Appendix B. All variables are represented on a log scale; the residual (viii) is only calculated from 1963 (Q2) onwards.

Figure 9.2 Variables in the Policy Equation

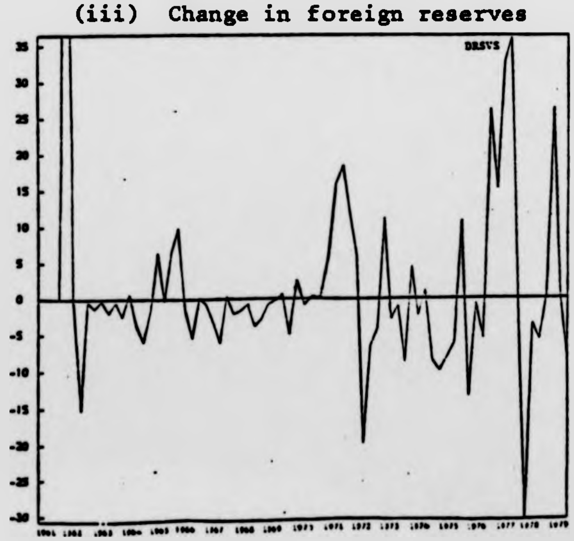
(i) Change in inflation



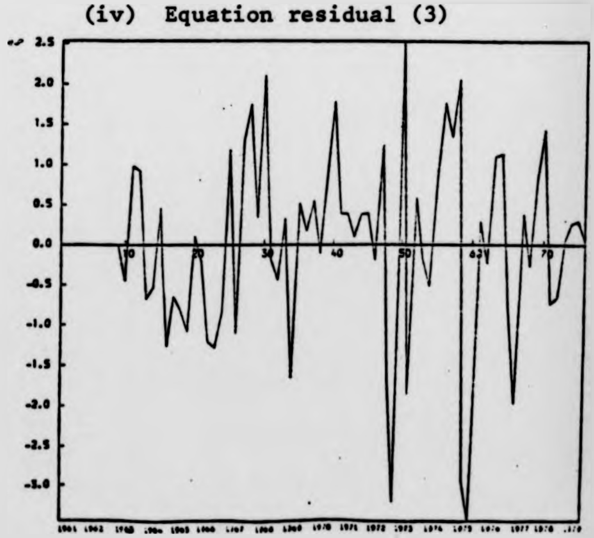
(ii) Unemployment deviation



(iii) Change in foreign reserves



(iv) Equation residual (3)



Note: See Appendix B for definition of variables.
The equation residual (iv) is only shown from 1963 (Q2) onwards.

The contribution of policy

In Table 9.3 the final direct contributions of changes in policy stance to wage inflation over the period are detailed. These effects are derived from the wage equation (3) of Table 9.1. and do not incorporate any further feedbacks from wages to prices etc.

The results can be summarised by the statement that the major policy effects occurred for the two periods of freeze in 1966 and late 1972; and Phases 1 and 2 of the Labour Government's policy between 1975 and 1977. Thus previous analyses of policy (see Chapter 2) may have been correct in picking out the freeze periods as the most relevant periods but the results shown in Table 9.3 show that the policy effects in other periods are generally non-zero and furthermore are far from uniform. In some cases either policy itself or policy catch-up effects have contributed to higher wage inflation (for example Stage 2 of the Conservative policy in 1973). Policy catch-up effects are particularly important in this period as they are in 1967 and 1977. Although announcement effects appear to be relatively unimportant this disguises the fact that most of the announcement effects have been reversed within the policy period, leaving little overall effect. Within particular policy episodes there were significant timing effects in 1966, 1968, 1972(3), 1975 and 1979. The announcement/anticipation effects of 1968 and 1979 will have acted to delay pay settlements whilst those in other periods contribute towards an advancement of settlements.

A more detailed examination of the policy effects shown in Table 9.3 implies that a tightening of policy pressure in 1965 and early 1966 helped to slow wage inflation. Some of the influence

Table 9.3 **Contribution of Incomes Policy to Wage Inflation 1963-79**

Estimates based on equation(3), Table 9.1

per cent per quarter

Policy period	Policy effect	Announcement effect	Catch-up effect	Total effect	Actual wage inflation
Guiding Light (2) 1963(4)-1964(4)	0.09	0.05	0.05	0.19	1.9
Early Warning 1965(1)-1966(2)	-0.22	-	0.06	-0.16	1.5
Standstill 1966(3)-1966(4)	-0.68	-	-	-0.68	1.4
Severe restraint 1967(1)-1967(2)	-0.65	-	0.24	-0.39	1.4
Restraint 1967(3)-1968(1)	-0.39	-	0.46	-0.07	1.7
Moderate restraint 1968(2)-1969(4)	-0.21	-	0.21	-	2.0
Little restraint 1970(1)-1970(2)	-0.05	-	0.16	0.11	3.3
No policy 1970(3)-1970(4)	0.13	-	0.31	0.44	3.0
N-1 policy 1971(1)-1972(1)	0.12	-	0.02	0.14	2.0
Search for voluntary policy 1972(2)-1972(3)	0.18	-	0.12	0.30	3.3
Stage 1 1972(4)-1973(1)	-0.87	-	-	-0.87	2.6
Stage 2 1973(2)-1973(3)	-0.025	-	1.16	0.91	3.7
Stage 3 1973(4)-1974(1)	-0.13	0.01	0.26	0.14	2.6
Social Contract 1974(2)-1975(2)	-0.11	-0.01	0.13	0.01	6.7
Phase 1 1975(3)-1976(2)	-2.08	-	0.42	-1.66	3.5
Phase 2 1976(3)-1977(2)	-1.74	-	0.14	-1.60	2.4
Phase 3 1977(3)-1978(2)	-0.79	-	1.09	0.30	3.3
Phase 4 1978(3)-1979(1)	-0.34	-	0.01	-0.33	3.0
Clegg 1979(2)-1979(4)	0.02	-	0.37	0.39	4.9

can be attributed to the TUC's reaction to the new Labour Government as well as the increasing formalisation of policy by the authorities. Although policy in the standstill was significantly restrictive actual wage inflation did not slow much but nor did it pick up again in the following six months as the overall policy influence eased. The less restrictive overall policy influence of early 1967 was due however to policy catch-up effects as the overall stance of policy remained much the same as during the standstill.[8]

During the remainder of 1967 as the stance of policy weakens and as further policy catch-up appears, the overall influence of policy is negligible, allowing wage inflation to pick up again. In 1968 and 1969 the real wage pressure of policy intensifies as the effects of the 1967 devaluation feed through to prices with the unchanged wage norm but at the same time there is an easing in both the degree of formal controls and the Government's attempts to use them, and a distinct erosion of trade union support, so that the overall policy effect weakens. As in late 1967 the effect of policy catch-up offsets the direct effect of policy and wage inflation continues to accelerate. By early 1970 both the informal and formal aspects of policy have led to a considerable weakening of policy pressure and with further policy catch-up effects, the overall impact of policy is a small contribution to the rather abrupt acceleration in wage inflation. It has become a common claim that the acceleration of wage inflation in 1969 and 1970 was a consequence of a breakdown of the incomes policy. The results shown in Table 9.3 imply that policy was at best accommodating and at worst slightly expansionary over this policy but cannot be blamed for the rapid acceleration of early 1970. By then most of the policy catch-up effects have already occurred. Nor can this acceleration be explained by 'normal' real wage catch-up since by the end of

1968 real wages were already in line with the implied growth of desired real wages (approximately 2½% p.a.) so that some other explanation is necessary for this acceleration. The most plausible must lie in other factors since the equation shows a particularly significant positive residual in 1970(2). Despite the further removal of policy pressure in the second half of 1970 and further policy catch-up effects, wage inflation eased. Policy pressure then remains weak and slightly expansionary until late 1972 and cannot be used to explain the slowdown of wage inflation in 1971 and the subsequent expansion in early to mid-1972.

Although the freeze of late 1972 had a zero norm it started almost half way through the last quarter of 1972 and although a significant increase in policy pressure occurs, this and the luke-warm reaction of the TUC mean that it is only sufficient to reduce wage inflation by less than 1 per cent per quarter against a prevailing rate of over 3 per cent.

The increase in the wage norm through 1973 together with a high degree of policy catch-up imply that the overall policy influence in 1973 was to <u>increase</u> wage inflation.[9] During 1974 and the Social Contract, policy pressure remains weak and the contribution of policy explains little of the very rapid acceleration of wage inflation during this period. Some policy catch-up is estimated to have occurred during 1975-76 and moderates the quite large policy influence during this period. Overall policy influence remains the same during 1976-77 as although the direct effect of policy pressure weakens there was less policy catch-up. During this period policy influence more than accounts for the slow-down in wage inflation. The following phase of policy between 1977 and 1978 is characterised by a marked weakening of overall policy pressure and consequent acceleration in inflation. The further weakening of the direct policy effect as trade union co-operation diminishes is coincidental with a strong policy catch-up. There is also a strong element of overall real wage catch-up during this period. In mid-1973 real wages were very close to their trend level but by the end of 1977 had fallen nearly 9 per cent below trend. By the end of 1978 however the gap was less than 3 per cent. The effectiveness of policy further weakens in 1978-9 as government controls became subject to challenge and as trade union support ebbs away further. The absence of policy catch-up however means that there is a small restraining effect from policy.

Finally, the election of the Conservative Government in May 1979 results in a neutral policy stance and with the presence of some policy catch-up overall policy influence helps to explain some of the acceleration in wage inflation during this period.

9.3 Simulation properties

Tables 6.5 - 6.7 of Chapter 6 simulated the properties of the restricted and unrestricted wage synthesis together with various forms of flexible price and exchange rate mechanisms but with an exogenous policy assumption. In this section policy is also assumed to be flexible so that one can examine the properties of the wage-price-policy-exchange rate sub-system. Output is still taken to be exogenous so that demand feedbacks are ignored but the sub-system selected is the one where the greatest degree of simultaneous feedback is present, both theoretically and empirically.[10] Similarly the effects of a changing exchange rate on the change in foreign reserves is also ignored.

Table 9.4 gives the results of changing some of the exogenous variables in the system.[11] In the first simulation unemployment is increased permanently by 100,000. There is no effect on wages in the current quarter as the unemployment variable only enters both wage and policy operations with a one-quarter lag. The effect builds up slowly to reduce wages by 1¼ per cent after one year, just over 3 per cent after 10 quarters and 3¼ per cent after 5 years. Thereafter there is a slight waning of the effect. Real wages are reduced by nearly one per cent after a year, with a peak effect of 1¼ per cent after 10 quarters. Some of the reduction in wages comes about as a result of the tightening of policy. This increases by nearly 1 percentage point after one year but then eases to ½ percentage point and gradually declines as lower price inflation starts to counteract the impact of higher unemployment. Given the coefficient on the policy variable in the wage equation the maximum impact is to reduce wage inflation by 0.2 per cent. As policy pressure eases so the policy catch-up mechanism comes into operation after nearly two

Table 9.4 Simulations with the Complete Model

Effect on wages (%)[a]

Using (3) from Table 9.1

Simulation:	1	2	3	4	5	6	7	8	9
Period 1	-	-	-	1.1	-0.2	-	1.1	-0.2	0.3
4	-1.3	-1.2	-1.4	2.3	-0.6	-0.4	0.1	-0.1	0.9
10	-3.1	-8.3	-3.5	4.2	-1.3	-0.4	0.3	-0.2	2.2
20	-3.5	-21.9	-5.9	6.3	-1.9	-0.2	0.1	-0.1	1.3

Effect on real wages (%)

Simulation:	1	2	3	4	5	6	7	8	9
Period 1	-	-	-	-0.2	-	-	-0.2	-	-0.1
4	-0.8	-0.8	1.6	-1.0	0.2	-0.2	-0.2	0.1	-0.3
10	-1.3	-4.4	0.8	-0.4	0.1	-0.1	-0.1	0.1	-0.2
20	-1.1	-8.7	0.2	-	-	-	-	-	-0.2

Effect on policy pressure (% points)

Simulation	1	2	3	4	5	6	7	8	9
Period 1	-	-	-	-0.7	0.1	-	-0.7	0.1	-0.2
4	-0.9	-1.1	0.2	-1.4	0.3	0.1	-	-	-0.5
10	-0.5	-3.2	0.2	-0.1	-	-	-0.2	-	-0.1
20	-0.3	-5.4	-	-	-	-	-	-	0.2

Effect of change of policy pressure on wages (%)

Simulation	1	2	3	4	5	6	7	8	9
Period 1	-	-	-	-0.2	-	-	-0.2	-	-0.1
4	-0.2	-0.3	0.1	-0.4	0.1	-	-	-	-0.1
10	-0.1	-0.8	0.1	-	-	-	-	-	-
20	-0.1	-1.4	-	-	-	-	-	-	-

Notes:

(a) Differences from base simulation.

1. Permanent 100,000 shock in level of unemployment
2. Increase in unemployment, growing by 50,000 per quarter
3. Permanent increase of 2½ per cent in the retention ratio
4. Permanent increase of 10 per cent in world prices
5. Permanent 1 per cent increase in output
6. Temporary increase of 2½ per cent in the retention ratio
7. Temporary increase of 10 per cent in world prices
8. Temporary increase of 1 per cent in level of output
9. Permanent increase of 10 per cent in indirect tax rate

years and increases wage inflation by almost ½ per cent per quarter for the next 3-4 quarters. The reduction in both nominal and real wages is greater than when policy influences are ignored. The catch-up effects are not sufficient to outweigh the direct effects of policy and it should be noted that although there is an automatic catch for real wages under the real wage resistance model the slow adjustment lag means that real wages can be depressed for a considerable period.

The second simulation examines the effect of a gradual increase of unemployment of 50,000 per quarter. After five years this has built up to a total increase of 1 million, quite drastic, but in fact unemployment rose by this amount in just one year between 1981 and 1982. As might be expected the result is to reduce both nominal and real wages by an increasing amount. The effect on policy pressure does not augment in the same way however as the reduction in price inflation gradually stabilises the influence of higher unemployment on policy pressure so that after 5 years the increase in policy pressure is only reducing wages by under 1½ per cent. Because, however, policy pressure is decreasing less rapidly in the base simulation the catch-up effects are smaller than in the base simulation and act to decrease wages compared with the base.

The third simulation increases the average retention ratio by 2½ per cent. As with unemployment the retention ratio only enters the wage equation with a lag. Although money wages fall, real after tax incomes rise, at least in the short-to-medium term. However inflation leads to a slight easing of policy pressure which has a minor expansionary influence on wages.

Next, consider a permanent increase of 10 per cent in foreign prices. Money wages rise steadily but not by the full amount of the increase in foreign prices but this reflects the outcome for domestic prices since real wages only fall temporarily. This follows as a result of the higher exchange rate on inflation as competitiveness improves. Policy effects are initially restrictive but then become minimal as the critical variable for policy, the rate of change of price inflation, reverts to its base simulation profile. The results of this simulation are therefore very close to the results presented in Chapter 6, Table 6.8.

Simulation 5 looks at the impact of a persistent 1 per cent increase in output (assuming no corresponding reduction in unemployment). The purpose of this simulation is to illustrate the effects on wages and policy of an increase in productivity growth. Thus the initial effect is on wage costs and prices. Prices and money wages do fall more or less in parallel although there is a small temporary improvement in real wages. After 5 years both prices and wages are nearly 2 per cent lower than in the base simulation. The change in the inflation rate is insufficient to produce more than a minor effect on policy pressure however. The next three simulations describe the outcome of temporary shocks to the exogenous variables. First the retention ratio is increased, then world prices, and finally the level of output. In all three simulations the shocks pass through the system eventually with the retention ratio change persisting the longest. The effects on policy pressure are trivial with the exception of the initial effect of the shock of foreign prices to inflation and hence policy.

Finally the indirect tax rate is increased by 10 per cent. Money wages increase with the effect building up for three years and then easing off. There is a small permanent reduction in real wages and the higher inflation induces a small policy response. Between periods 10 and 20 however, policy pressure eases compared with the

Table 9.5 **Tests for Symmetry**

Calculations using model (3) from Table 9.1[a]

Change in unemployment

		Wages(%)	Real wages (%)	Policy (% pts)
period 1:	increase	-	-	-
:	decrease	-	-	-
4:	increase	-1.3	-0.8	-0.9
:	decrease	1.6	1.0	0.9
10:	increase	-3.1	-1.3	-0.5
:	decrease	3.6	1.6	0.5
20:	increase	-3.5	-1.1	-0.3
:	decrease	4.0	1.3	0.4

Change in foreign prices

		Wages(%)	Real wages(%)	Policy (% pts)
period 1:	increase	1.1	-0.2	-0.7
:	decrease	-0.9	0.3	0.6
4:	increase	2.3	-1.0	-1.4
:	decrease	-2.2	1.1	1.3
10:	increase	4.2	-0.4	-0.1
:	decrease	-4.2	0.2	0.3
20:	increase	6.3	-	-
:	decrease	-6.3	-	-

Note:

(a) Differences from base simulation
Simulations correspond to 1 and 4 from Table 9.5

base simulation and this leads to a policy catch-up effect which delays the easing of the wage increase.

The properties of the model are reasonably linear and symmetrical (see Table 9.5). The main element of asymmetry comes from the operation of the catch-up variable, but this has a minor effect.[12] The properties of the model are such that changes in real wages can persist over reasonably long periods of time, despite the adoption of a real wage resistance model. This reflects in part the slow rate of real wage catch-up. The role of the policy equation differs between the source of the exogenous shock. In some cases, for example, the unemployment simulation, it reinforces the initial reduction in money and real wages whilst in others, such as the simulation of higher world prices,it moderates the increases in wages. The estimated coefficients on policy in the wage equation and on inflation in the policy equation imply only a small response of wages to a change in the inflation[13] so that whilst the properties of the equation sometimes increase the stability of the wage-price system they are not radical enough to guarantee stability. Indeed it would be odd to argue from historical experience that the wage-price nexus delivers a stable solution to exogenous shocks. Whilst the presence of the policy catch-up variable inevitably erodes some of the impact of policy on wages, it again is not sufficient to offset the effects of policy. The real wage catch-up mechanism implies of course that any reduction in real wages due to policy will eventually be compensated but the lags may be substantial and this compensation depends on a policy effect on real wages.[14]

9.4 Summary and conclusions

This chapter examines the complete model of wages and policy. Joint estimation of the wages and policy operations, together with a price equation results in a lower policy coefficient in the wages equation than obtained by non-simultaneous methods of estimation. Significant policy and policy catch-up effects are found but there is little to choose between wage models which merely incorporate the policy variable as an additional additive factor and those which use the stance of policy to influence the contribution of the other independent variables. Thus it does appear legitimate to use the simpler method of incorporating policy pressure. Although incomes policy is seen to be an important determinant of wage inflation the size of its coefficient suggests a considerable slippage between ex-ante and ex-post pressure. Analysis of the contributions of policy over the period reveals a considerable variation in effect with particularly important contributions towards lowering wage inflation between 1975 and 1977. In some instances however either policy itself or policy catch-up effects have contributed to higher wage inflation with policy catch-up effects being quite important in 1967 and 1977. Although announcement effects appear to be relatively unimportant this disguises the fact that most of the announcement effects have been reversed within quite short time periods. The policy equations show that changes in the inflation rate and in deviations of unemployment from its moving average are about equally important in policy determination. There appears to be considerable inertia in policy setting however. There is some evidence that the authorities have reacted asymmetrically to changes in unemployment.

The simulation properties of the model confirm the analysis of those shown in Table 6 where persistent divergencies between real wages and their trend level could occur despite the adoption of a real wage resistance model. The role of policy varies with the source of exogenous shock, in some cases it augments the initial shock to wages whilst in others it moderates the shock. The nature of the sub-system is not enough to guarantee stability of the wage price spiral however. Indeed in the light of historical experience it would be implausible if it did.

Notes to Chapter 9

1. The type of analysis was also given in Chapter 6 but referred to the single-equation estimates.

2. Note that IP4 = IP1*IPS

3. The policy equations in this chapter are estimated using seasonally unadjusted data.

4. Equations (1) and (2) explain the policy measure IP4 by means of lagged inflation and the lagged level of unemployment whilst equation (3) uses the change in inflation rate and the lagged deviation of unemployment from a 6-quarter moving average as independent variables.

5. The restriction of the coefficient on the inflation variable to unity continues to be justified empirically.

6. The equations are not directly comparable in Table 9.1 since the specification of the policy equation differs.

7. One-half of the adjustment is completed within one year and three-quarters within 2 years.

8. Although some easing in the degree of formal controls and the inclusion of deferred settlements in the wage norm might lead one to expect a sustained easing of policy, the real wage pressure of policy is greater as price inflation did not slow as rapidly as wage inflation.

9. Both as a result of the 'basic' norm and the allowance for exceptions to it (see Table 5.2).

10. The demand effects would come about primarily as a result of the foreign trade implications of any change in price competitiveness and from the link between wages and prices and real incomes.

11. In addition to introducing a flexible policy response the results quoted here differ from those given in Chapter 6 as different wage and price equations are used.

12. If the policy equation incorporated the asymmetrical effect of unemployment, e.g. equation (4) in Table 9.1 the unemployment simulations would lead to different results depending on the direction of change of the unemployment shock.

13. A 1 per cent change in the inflation rate will have an impact effect on policy of -0.4 percentage points and an effect of less than 0.1 per cent on wages.

14. The simulations shown in Chapter 6 show that a permanent change in policy pressure can lead to a reduction in real wages over a considerable length of time.

CHAPTER 10. FINAL CONCLUSIONS

The first chapter of the thesis identified three main areas of weakness emerging from previous empirical literature on incomes policy. The first was the lack of a continuous quantitative measure of policy. Both the lack of a measure of quantity and the discontinuous nature of measures used have led to conflicting and confusing analyses of policy. By using the various pieces of information available regarding policy it has proved possible to construct a quantity measure which reflects the real wage pressure of policy. By further adjusting this measure to take account of the intensity with which government has pursued incomes policy and the nature of the response of the trade union movement an overall measure of ex-ante policy pressure can be constructed on a continuous basis and this is shown in index form in Table 10.1. Although the index shows that the strength of policy was relatively great during the pay freezes of 1966 and 1972 and so provides some justification for the common selection of this period in previous empirical literature, it can also be seen that policy was very severe between 1975 and 1977, and that policy pressure was far from neutral and generally quite variable through the remaining parts of the period under consideration. It is therefore inappropriate to select two or three periods as those where incomes policy 'operated' and ignore the remainder of the period.

Having measured policy the second aim is to examine its influence on wage inflation. In Chapter 3 two alternative models of wage inflation are considered. In one the intensity of policy (i.e. Government and trade union components) are allowed to influence the contributions of other variables in the wage equation with the real wage pressure of policy entering the equation independently. In the second the overall policy variable merely enters as an

Table 10.1 **Index of Policy Pressure**

1970(3) = 100

1961	1	100.8	1971	1	100.8
	2	101.1		2	100.9
	3	98.8		3	100.2
	4	98.1		4	100.1
1962	1	98.4	1972	1	100.2
	2	99.2		2	100.7
	3	98.9		3	100.7
	4	99.6		4	98.0
1963	1	100.0	1973	1	95.4
	2	99.8		2	99.5
	3	100.3		3	98.6
	4	100.7		4	99.5
1964	1	100.5	1974	1	99.4
	2	100.6		2	98.7
	3	100.6		3	99.2
	4	99.4		4	100.0
1965	1	99.3	1975	1	100.0
	2	99.3		2	100.0
	3	98.6		3	94.5
	4	99.0		4	90.1
1966	1	99.2	1976	1	91.1
	2	99.3		2	93.2
	3	97.9		3	94.5
	4	96.9		4	94.1
1967	1	97.9	1977	1	93.2
	2	97.1		2	92.1
	3	98.1		3	94.0
	4	98.9		4	95.6
1968	1	98.6	1978	1	98.1
	2	100.5		2	100.3
	3	99.4		3	99.4
	4	98.7		4	98.3
1969	1	98.9	1979	1	98.4
	2	98.4		2	99.7
	3	99.1		3	100.4
	4	99.2		4	100.2
1970	1	99.8			
	2	99.9			
	3	100.0			
	4	101.0			

Note: Derived from policy measure IP4. A lower value of the index indicates a higher policy pressure.

additional explanatory variable. These models are applied using the real wage resistance model and particular attention is paid to the role of announcement and policy catch-up effects. The results indicate that there is little to choose between the more complicated incorporation of policy and the simple method and this provides some justification for the usual approach adopted of merely adding an incomes policy variable to the equation.

The policy effects emerging from the estimated equations are statistically significant but their magnitude indicates a considerable slippage between ex-ante and ex-post policy effects with an average of 1 per cent increase in policy pressure leading to only one quarter of a per cent reduction in wage inflation. The results confirm that announcement effects are usually only those of timing and that they are not, in general, statistically significant. Specific policy catch-up effects are marginally significant however and imply that there is an increase in wages as policy pressure eases independent of any real wage catch-up embodied in the real wage resistance model. A 1 percentage point reduction in policy pressure can lead to one-half a per cent increase in wage inflation due to the policy catch-up effect, although this only applies for the period of reduction. The size of the catch-up effect is independent of the length of period of policy pressure which precedes its easing and so the conclusion is that gains from policy are greater the longer the period of 'tight' policy. Short-lived periods of relatively severe policy are likely to be eroded by the policy catch-up (see Table 10.2). The nature of the policy catch-up makes the wage model asymmetrical in its response to policy. Whilst a sustained 3 percentage point increase in policy pressure will reduce money wages by 1¼ per cent in the first period and 13 per cent after 5 years (¾ per cent and 4¾ per cent for real wages) an equivalent

Table 10.2 **Impact on Wage Inflation from Policy**

% difference from base simulation

	Policy pressure					
	Sustained increase of 3 per cent points		Sustained decrease of 3 per cent points		Temporary reduction of 3 per cent points	
	Money	Real	Money	Real	Money	Real
Quarter 1	-1.2	-0.8	3.0	2.0	-1.2	-0.8
4	-4.3	-2.5	6.3	3.4	0.6	0.4
10	-9.8	-4.6	12.3	4.8	0.5	0.1
20	-13.1	-4.8	17.1	5.2	0.2	-

easing of policy results in 3 per cent higher money wages in the first quarter and 17 per cent after 5 years (2 and 5 per cent respectively for real wages).

Analysis of the contribution of policy over the period finds the main policy influences occurring during the freeze of 1966 and the following period of severe restraint, the standstill of late 1972/early 1973, and phases 1-3 of the Labour government's policy of 1975-1978. However during the period of severe restraint in 1967 and Phase 3 of policy in 1977-78 policy catch-up effects were sufficient to offset the direct impact of policy. Catch-up effects were also important during Stage 2 of Conservative policy in 1973. The policy effects (allowing for catch-up) over the period suggest an overall reduction in wages of 12 per cent over 16 years or just over 1 per cent per annum. This effect may appear small but it is not spread evenly over the period.

The third and final aim of the thesis was to explain the setting of policy. Although the biases in estimation from treating policy as predetermined in the wage equations appear to be minor, the incorporation of endogenous policy setting within the wage-price sub-sector of a macroeconomic model may fundamently affect its properties and further the decision to impose policy is seen not to be arbitary as is suggested by the economic literature. Using a modified reaction-function approach it is indeed possible to explain movements in the quantitative index of policy by movements in inflation and unemployment. The form of the inflation variable which enters the policy equation is the rate of change of inflation however, whilst the appropriate definition of unemployment is the deviation of unemployment from a moving average of unemployment: thus persistence of high unemployment is discounted for policy purposes.

This could either imply a gradual change in the view of the empirical trade-off by the authorities or a change in the preference function but it is not possible to distinguish between these alternative explanations. There is also some evidence that the authorities have reacted asymmetrically to changes in employment with increases in unemployment signalling an increase in policy pressure but with a decrease leading to no easing of policy. No such asymmetry or crisis explanation appears to hold for inflation. Both inflation and unemployment are found to have very similar effects on policy but there also appears to be considerable inertia in policy. A 1 per cent increase in the rate of inflation has an immediate impact of 0.4 percentage of points on policy but a long-run impact of over 3½ points, whilst an increase in unemployment of a little under 100,000 would have a similar effect.

The overall properties of the wage model together with price, exchange rate and policy feedback reveal that whilst policy feedback modifies some of the responses of wages to exogenous shocks it is not sufficient to ensure stability of the system. In some cases policy feedback amplifies the effect of the exogenous shock, whilst in others it dampens the impact. The finding of a unit coefficient on prices in a real wage resistance formulation has often been taken to imply an unstable solution under flexible exchange rates but the model developed here does not have this property. This partly reflects policy feedback but also the slow rate of real wage adjustment and the adoption of an exchange rate model which is not completely flexible to changes in competitiveness (indeed it is hard to find an empirical account of exchange rate behaviour which supports such a completely flexible exchange rate mechanism).

Finally it should be said that although the wage model adopted here is that of real wage resistance and thus to some extent the results are dependent on this description of empirical behaviour the research has more general relevance in that whatever wage model is adopted a quantity measure of policy and allowance for policy feedback are essential features.

APPENDIX A

CHRONOLOGY OF INCOMES POLICY

CHRONOLOGY OF INCOMES POLICY

1961	- JULY	:	Pay pause announced Council on Prices, Productivity and Incomes recommended national policy on wages
	- AUGUST	:	Pay pause extended to workers covered by Wage Councils
	- NOVEMBER	:	Pay pause guidelines broken by Electricity Council
1962	- FEBRUARY	:	Publication of White Paper (Cmnd.1626) 'Incomes Policy the Next Step', proposing a norm of 2-2½ per cent
	- MARCH	:	End of pay pause
	- APRIL	:	Several wage councils asked to reconsider their awards but they refused to lower them
	- JULY	:	Government announces intention of setting up National Incomes Commission. This is approved by employers but not the unions
	- NOVEMBER	:	NIC established with norm of 2-2½ per cent per annum
	- DECEMBER	:	NIC receives first reference
1963	- FEBRUARY	:	NIC declares 2-2½ per cent norm to last for at least one year
	- APRIL	:	NIC declares new norm of 3-3½ per cent from October
1964	- OCTOBER	:	Election of new Labour Government
	- NOVEMBER	:	Draft statement of intent on prices and incomes policy, NIC abolished
	- DECEMBER	:	Final statement of intent agreed
1965	- FEBRUARY	:	New National Board for Prices and Incomes (NBPI) proposed
	- APRIL	:	NBPI established White Paper (Cmnd.2639) 'Prices and Incomes Policy' Bill proposed norm of 3-3½ per cent

1965	- MAY	:	NBPI receives first three references
	- NOVEMBER	:	White Paper (Cmnd.2808) "Prices and Incomes: an Early Warning System" Proposes enabling legislation for delay of settlements
1966	- FEBRUARY	:	Prices and Incomes Bill published with legal penalties for violations
	- JUNE	:	Delay up to one month - if referred to NBPI increase deferred until after the Report
	- JULY	:	Prices and Incomes Bill passed White Paper (Cmnd.3073) 'Prices and Incomes Standstill' announces a six-month freeze on wages and prices.
	- OCTOBER	:	Cabinet announces activation of Part IV - the compulsory provision of the Prices and Incomes Act
	- NOVEMBER	:	White Paper (Cmnd.3150) on policy in the six months after the freeze, 'Prices and Incomes Standstill: Period of Severe Restraint'
1967	- JANUARY	:	Beginning of 'severe restraint' phase of policy
	- MARCH	:	White Paper (Cmnd.3235) on policy after June. 'Prices and Incomes Policy after 30 June 1967' TUC and CBI voluntary vetting replaces compulsory notification
	- JULY	:	Further phase of restraint begins with TUC vetting wage claims
	- AUGUST	:	Part IV of the Prices and Incomes Act allowed to lapse
1968	- JANUARY	:	3½ per cent maximum announced for the year following July 1968
	- APRIL	:	White Paper (Cmnd.3590) 'Productivity, Prices and Incomes Policy in 1968 and 1969' announces 12 months delaying powers
	- SEPTEMBER	:	TUC congress votes 7.7 million to 1 million for repeal of Prices and Incomes Act
1969	- APRIL	:	Reactivation of Part II of Prices and Incomes Act when 1967 and 1968 legislation expired (3 month delay)

1969	- SEPTEMBER	:	TUC congress votes for complete repeal of Prices and Incomes Act, including wage-freeze powers and statutory Prices and Incomes Board
	- DECEMBER	:	White Paper (Cmnd.4237) 'Productivity, Prices and Incomes Policy after 1965' proposes new ceiling of 2½ - 4½ per cent. TUC rejects White Paper.
1970	- JANUARY	:	TUC ends vetting
	- NOVEMBER	:	It is announced that NBPI to be wound up 'N-1' policy starts
1971	- MARCH	:	NBPI finally wound up
	- JULY	:	period of CBI price restraint accompanied by holding back of nationalised industry prices
	- NOVEMBER	:	Miners overtime ban
1972	- JANUARY	:	Miners strike
	- FEBRUARY	:	Miners return to work
	- MARCH	:	'N-1' policy accepted as finished
	- JULY	:	CBI does not renew support for price restraint
	- AUG/SEPT	:	Talks between Government, TUC and CBI over £2 pay limit break down
	- NOVEMBER	:	90 day standstill on pay and prices with possible extension for 60 days (Counter-Inflation Act) (Cmnd.5125) 'A Programme for controlling Inflation: the First Stage' Government orders employers not to make pay offers until guidelines are announced
1973	- JANUARY	:	White Paper (Cmnd.5205) 'The Programme for Controlling Inflation: The Second Stage' sets out norm of £1 per week plus 4 per cent for Stage 2 and establishes Price Commission and Pay Board. Standstill extended by 60 days
	- FEBRUARY	:	Green Paper (Cmnd.5245) 'The Prices and Incomes Code, a Consultative Document'
	- MARCH	:	Standstill ends
	- APRIL	:	Stage 2 begins

1973	-	OCTOBER	:	proposals for Stage 3 announced
	-	NOVEMBER	:	Stage 3 begins Miners' overtime ban
1974	-	FEBRUARY	:	Miners' strike and 3 day week
				General Election
	-	MARCH	:	Labour Party forms Government Miners accept pay rise
	-	JUNE	:	TUC backs voluntary wage restraint to follow lifting of statutory wage control
	-	JULY	:	Pay Board ceased to exist
	-	OCTOBER	:	End of threshold arrangements
	-	DECEMBER	:	TUC guidelines for social contract published
1975	-	JULY	:	White Paper (Cmnd.6151) announces £6 per week limit from August
	-	AUGUST	:	£6 per week limit begins
	-	SEPTEMBER	:	TUC congress approves pay policy
1976	-	APRIL	:	Chancellor promises tax cuts conditional on TUC agreement to norm of 3 per cent in Phase 2
	-	MAY	:	proposals for Phase 2 to begin in August announced as agreed with TUC
	-	JUNE	:	White Paper (Cmnd.6507) 'The Attack on Inflation - the Second Year' presents final terms for Phase 2
	-	JULY	:	Phase 2 formally endorsed by TUC
	-	AUGUST	:	Phase 2 begins
1977	-	MARCH	:	More tax cuts conditional on pay agreement
	-	JULY	:	Phase 2 ends
			:	GMWU votes for return to unfettered collective bargaining
	-	AUGUST	:	Phase 3 (Cmnd.6882) 'The Attack on Inflation after 31st July 1977' proposes maximum of 10 per cent

1977	-	SEPTEMBER	:	TUC votes in favour of committment not to re-open incomes policy settlements before they have run 12 months.
1978	-	JULY	:	White Paper (Cmnd.7253) 'Winning the battle against inflation' proposing 5 per cent settlements
	-	DECEMBER	:	Parliament rejects discriminatory sanctions against companies breaking 5 per cent
1979	-	JANUARY	:	Policy relaxes under pressure of public sector strikes. Pay comparability exercise for public sector established (Clegg Commission). Government allows increases of up to £3.50 per week for those earning £70 or less
	-	FEBRUARY	:	Joint statement between TUC and Government "The Economy, the Government and Trade Union Responsibility"; recognises failure of Phase 4 and sets target for less than 5 per cent inflation by 1982.
	-	MAY	:	Election of Conservative Government committed to removing any controls on wages but allow 'Clegg' committments to be honoured.

APPENDIX B

DEFINITION AND SOURCES OF DATA

General Data

Note: In Chapters 6 and 9 seasonally unadjusted data are used;

In Chapter 8 seasonally adjusted data are used.

W	:	Wages and salaries per employee; £ per employee per quarter
P	:	Retail Price Index, 1975 = 1.0
U	:	Wholly unemployed excluding school leavers
r	:	Average retention ratio, defined as ratio of post-tax to pre-tax personal income
GDP	:	GDP, output measure at 1975 prices
WP	:	World prices; defined as P*EXCH/COMP where EXCH = dollar exchange rate; COMP = index of price competitiveness
RSVS	:	Level of gold and foreign exchange reserve

Source for above data: Economic Trends Annual Supplement

Further definitions

$\Delta\log P = \log(P_t/P_{t-1})$		price inflation as used in wage equation
$\Delta\log W = \log(W_t/W_{t-1})$		wage inflation
PCPI	$= 100^* (P_t - P_{t-4})/P_{t-4}$	price inflation in policy equation
DPCPI	$= PCPI_t - PCPI_{t-1}$	change in price inflation in policy equation
DLPA	$= \log(1+IPA_t/_{100}) - \log(1 + IPA_{t-1}/_{100})$	announcement variable in wage equation
IPA	$= \lambda^*_t(-\Delta IP4_{t+1})$	

where $\Delta IP4_{t+1}$ is the actual change in the policy measure in t + 1

λ^*_t = PROP*Q where PROP is the standardised proportion of workers settling in each quarter and Q is the proportion of the quarter during which the announcement was effective.

CATCH = $\log(1 + \Delta IP4^{*} * PROP/100)$ policy catch-up variable in wage equation

where $\Delta IP4^{*} = \Delta(IP4)$ for $\Delta(IP4) > 0$ and $\Delta IP4^{*} = 0$ for $\Delta(IP4) < 0$

DU1 = $U_{t-1} - {}^{1}/_{6} \sum_{i=1}^{6} U_{t-i}$

- deviation of unemployment from 6-quarter moving average, lagged by one quarter. Appears in policy equation

DUPOS1 = DU1 for DU1 > 0

= 0 for DU1 < 0

- positive deviation of unemployment from moving average, used in policy equation

RSVS = $(RSVS/P)_t - (RSVS/P)_{t-1}$

- change in foreign reserves, appears in policy equation

LPGAP = deviation of real wages from a 12 quarter moving average of real wages, used in wage equation

<u>Incomes policy variables</u>

IP1 Real wage pressure of incomes policy; = $\dot{wn} - \dot{P}_{t-1}$

IP2 Real wage pressure of incomes policy less trend real wages

IP3 Real wage pressure of incomes policy adjusted for govt. attitude (GPS)

IP4 Real wage pressure of incomes policy adjusted for govt. and TUC attitudes (GPS & TPS)

IP5 As IP4 but uses strikes as index of TUC attitudes

IPS Index of govt. and TUC attitudes

IP3 = IP1 * GPS

IP4 = IP1 * IPS

IPS = ½ (GPS+TPS)

IP5 = IP1 * GPS * Strikes

Strikes = no. of working days lost   Source DE *Gazette*

Policy dummies

D1	1961(3) - 1961(4) = 1, zero otherwise
D2	1962(1) - 1962(3) = 1, zero otherwise
D3	1966(3) - 1966(4) = 1, zero otherwise
D4	1967(1) - 1967(2) = 1, 1967(3) = 0.33, zero otherwise
D5	1967(3) = 0.67, 1967(4) - 1968(1) = 1, zero otherwise
D6	1968(2) - 1969(4) = 1, zero otherwise
D7	1970(1) - 1970(4) = 1, zero otherwise
D8	1972(4) = 0.67, 1973(1) = 1, zero otherwise
D9	1973(2) - 1973(3) = 1, 1973(4) = 0.33, zero otherwise
D10	1973(4) = 0.67, 1974(1) = 0.67, zero otherwise
D11	1975(3) = 0.67, 1975(4) - 1976(2) = 1, 1976(3) = 0.33, zero otherwise
D12	1976(3) = 0.67, 1976(4) - 1977(2) = 1, 1977(3) = 0.33, zero otherwise
D13	1977(3) = 0.67, 1977(4) - 1978(2) = 1, 1978(3) = 0.33, zero otherwise
D14	1978(3) = 0.67, 1978(4) - 1979(1) = 1, 1979(2) = 0.33, zero otherwise

Table B.1 Basic Data

	AVERAGE WAGES £ per employee quarter	RETENTION RATIO	PRICES 1975=100		AVERAGE WAGES £ per employee quarter	RETENTION RATIO	PRICES 1975=100
1961 1	162.3	0.836	37.0	1971 1	319.6	0.788	57.2
2	166.5	0.854	37.5	2	331.8	0.810	59.3
3	167.0	0.866	38.0	3	341.3	0.807	60.1
4	171.5	0.869	38.4	4	353.1	0.815	60.8
1962 1	170.4	0.824	38.8	1972 1	353.2	0.797	61.8
2	173.0	0.852	39.6	2	372.3	0.825	62.9
3	175.3	0.854	39.4	3	377.0	0.821	64.0
4	179.0	0.867	39.4	4	397.8	0.830	65.5
1963 1	177.6	0.830	40.0	1973 1	397.3	0.802	66.7
2	180.3	0.849	40.2	2	419.5	0.822	68.8
3	182.6	0.861	39.9	3	427.9	0.817	69.9
4	188.0	0.866	40.2	4	448.5	0.820	72.3
1964 1	188.9	0.831	40.6	1974 1	450.6	0.801	75.2
2	192.3	0.845	41.3	2	479.7	0.807	79.7
3	194.5	0.849	41.7	3	518.9	0.792	81.7
4	201.3	0.863	42.0	4	579.4	0.782	85.4
1965 1	200.7	0.830	42.4	1975 1	620.8	0.775	90.5
2	204.6	0.833	43.5	2	629.0	0.779	99.1
3	207.4	0.834	43.7	3	665.4	0.763	103.4
4	214.3	0.840	43.9	4	683.3	0.767	107.0
1966 1	216.9	0.813	44.3	1976 1	697.5	0.762	110.9
2	219.6	0.826	45.1	2	723.9	0.763	114.9
3	217.5	0.834	45.3	3	747.6	0.775	117.6
4	225.9	0.843	45.6	4	764.7	0.766	123.0
1967 1	223.3	0.809	45.9	1977 1	781.0	0.761	129.2
2	232.2	0.820	46.3	2	797.7	0.772	134.9
3	231.6	0.826	46.0	3	818.8	0.781	137.0
4	242.0	0.831	46.6	4	841.4	0.793	139.0
1968 1	244.4	0.808	47.2	1978 1	867.5	0.778	141.4
2	246.7	0.821	48.4	2	911.7	0.789	145.3
3	246.9	0.810	48.6	3	940.2	0.802	147.8
4	258.3	0.817	49.2	4	964.0	0.802	150.3
1969 1	260.0	0.803	50.2	1979 1	998.3	0.796	155.0
2	264.5	0.816	51.0	2	1,043.6	0.799	160.7
3	264.9	0.806	51.1	3	1,101.6	0.803	171.4
4	281.1	0.813	51.7	4	1,157.3	0.815	176.2
1970 1	281.6	0.797	52.7				
2	300.4	0.804	54.0				
3	305.2	0.803	54.6				
4	319.0	0.817	55.7				

Table B.2 Incomes Policy Variables

	POLICY MEASURE (IP4)	ANNOUNCEMENT	CATCH-UP		POLICY MEASURE	ANNOUNCEMENT	CATCH-UP
1961 1	1.242	-	-	1971 1	0.849	-	-
2	1.125	-	-	2	0.912	-	0.016
3	-1.209	-	-	3	0.157	-	-
4	-1.758	-	-	4	0.107	-	-
1962 1	-1.630	-0.021	-	1972 1	0.236	-	0.032
2	-0.828	-	-	2	0.676	-	0.119
3	-1.085	-	-	3	0.696	-	0.005
4	-0.385	-	0.182	4	-1.989	0.230	-
1963 1	-0.034	-	0.086	1973 1	-4.638	-	-
2	-0.193	-	-	2	-0.497	-	1.122
3	0.320	-0.139	0.125	3	-1.428	-	-
4	0.725	-	0.104	4	-0.450	-	0.255
1964 1	0.478	-	-	1974 1	-0.620	0.014	-
2	0.550	-	0.0190	2	-1.290	-	-
3	0.554	-	-	3	-0.830	-	0.103
4	-0.581	-	-	4	0.011	-	0.218
1965 1	-0.684	-	-	1975 1	-0.011	-	-
2	-0.653	-	0.008	2	-0.027	-	-
3	-1.370	-	-	3	-5.457	0.401	-
4	-1.004	-	0.096	4	-9.889	-	-
1966 1	-0.768	-	0.059	1976 1	-8.907	-	0.239
2	-0.736	-	0.008	2	-6.775	-	0.570
3	-2.106	0.101	-	3	-5.542	-	0.269
4	-3.112	-	-	4	-5.896	-	-
1967 1	-2.098	-	0.247	1977 1	-6.781	-	-
2	-2.889	-	-	2	-7.903	-	-
3	-1.929	-	0.235	3	-6.012	-	0.462
4	-1.120	-	0.211	4	-4.385	-	0.424
1968 1	-1.425	-	-	1978 1	-1.880	-	0.613
2	0.451	-0.508	0.510	2	0.348	-	0.605
3	-0.621	-	-	3	-0.606	-	-
4	-1.291	-	-	4	-1.730	-	-
1969 1	-1.144	-	0.037	1979 1	-1.643	-	0.022
2	-1.571	-	-	2	-0.305	-0.243	0.363
3	-0.889	-	0.153	3	0.380	-	0.169
4	-0.781	-	0.029	4	-0.183	-	-
1970 1	-0.218	-	0.137				
2	-0.144	-	0.019				
3	-	-	0.031				
4	1.031	-	0.268				

APPENDIX C

DETAILED CALCULATIONS OF THE CENTRAL WAGE

NORM AND EXCEPTIONS

The Central Wage Norm

Details of Policies from 1973 to 1978

(a) 1973 April to 1973 November "Stage 2"

The central wage norm consisted of £1 p.w. plus 4% of earnings. The average increase for the whole economy implied by this rule therefore depends on the structure of earnings. Using the New Earnings Survey for 1973 the distribution of earnings by type of worker is used to calculate the maximum entitlements under the policy. These are then weighted together to give the basic wage norm. Thus:

£1 + 4% applied to:

		lowest decile	lower quartile	median	upper quartile	highest decile	mean
manual men	£p.w.	1.98	2.19	2.46	2.78	3.13	2.52
	%	8.1	7.4	6.7	6.3	5.9	6.6
Non-manual	£p.w.	2.06	2.32	2.71	3.24	2.96	2.92
	%	7.8	7.0	6.3	5.8	5.4	6.1
Manual women	£p.w.	1.52	1.63	1.76	1.92	2.09	1.79
	%	11.6	10.4	9.3	8.4	7.7	9.1
Non-manual women	£p.w.	1.58	1.71	1.89	2.15	2.51	1.99
	%	10.8	9.6	8.5	7.5	6.6	8.0

weighted average for whole economy = 6.9

(b) 1973 November to 1974 July "Stage 3"

The basic norm consisted of 7 per cent or £2.25 with a limit of £350 p.a. (£6.73 p.w.). Threshold provisions are considered separately. The same method of determining the whole eocnomy average as for Stage 2 is used following the New Earnings Survey results for 1974.

7% or £2.25 p.w. applied to:

		lowest decile	lower quartile	median	upper quartile	highest decile	mean
manual men	£p.w.	2.25	2.41	2.93	3.54	4.22	
	%	7.8	7.0	7.0	7.0	7.0	7.1
non-manual men	£p.w.	2.25	2.63	3.40	4.42	5.82	
	%	7.4	7.0	7.0	7.0	7.0	7.0
manual women	£p.w.	2.25	2.25	2.25	2.25	2.28	
	%	14.3	12.0	9.9	8.3	7.0	10.7
non-manual women	£p.w.	2.25	2.25	2.25	2.33	2.96	
	%	12.9	10.9	8.6	7.0	7.0	9.6

weighted average for whole economy = 7.9%

Threshold provisions

Thresholds became due in the second quarter of 1974 (April). The entitlement was 40p. for each 1 per cent increase in the index above a level of 7 per cent compared with the level of October 1973. Implications for earnings are as follows:

Thresholds

Earnings range	Q.2 0.50p.w.	Q3 2.44	Q4 3.59
0-5	10.0	44.4	44.9
5-10	5.0	23.2	27.6
10-12	4.2	19.5	23.9
12-15	3.3	15.7	19.9
15-17	2.9	13.9	18.0
17-20	2.5	11.9	15.6
20-22	2.3	10.8	14.4
22-25	2.0	9.6	12.8
25-27	1.9	8.9	12.0
27-30	1.7	8.0	10.9
30-32	1.6	7.5	10.3
32-35	1.4	6.9	9.4
35-37	1.3	6.5	9.0
37-40	1.3	6.0	8.3
40-42	1.2	5.7	8.0
42-45	1.1	5.3	7.5
45-47	1.1	5.1	7.2
47-50	1.0	4.8	6.8
50-52	1.0	4.6	6.5
52-55	0.9	4.3	6.2
55-60	0.8	4.0	5.7
60-65	0.8	3.7	5.3
65-70	0.7	3.5	4.9
70-80	0.6	3.0	4.3
80-90	0.6	2.7	3.9
90-100	0.5	2.4	3.5
100-110	0.5	2.2	3.2
110-120	0.4	2.0	2.9
120-130	0.4	1.9	2.7
130-150	0.3	1.6	2.3
150-170	0.3	1.4	2.1
170-200	0.3	1.2	1.8
200-250	0.2	1.0	1.4
Men	1.2	5.6	8.1
Women	2.0	7.9	11.5
All	1.5	6.6	9.7

(c) **'Phase 1' August 1975-July 1976**

Basic norm £6 p.w. Calculations using NES Survey for 1975

Distribution of earnings

Earnings range (£)	% increase
0-10	60.0
10-12	50.0
12-15	40.0
15-20	30.0
20-22	27.3
22-25	24.0
25-27	22.2
27.30	20.0
30-32	18.8
32-35	17.1
35-37	16.2
37.40	15.0
40-42	14.3
42-45	13.3
45-47	12.8
47-50	12.0
50-55	10.9
55-60	10.0
60-65	9.2
65-70	8.6
70-75	8.0
75-80	7.5
80-85	7.1
85-90	6.7
90-95	6.3
95-100	6.0
100-110	5.5
110-120	5.0
120-130	4.6
130-150	4.0
150-170	3.5
170-200	3.0
200-250	2.4
250 or more	1.7

Average: Men 11.3%, Women 17.9%, All 13.8%

(d) 'Phase 2' August 1976-July 1977

Basic norm: earnings of less than £50 p.w. a maximum entitlement of £2.50

earnings of between £50 and £80 p.w. a maximum entitlement of 5% of earnings

earnings of greater than £80 p.w. a maximum of £4 p.w.

New Earnings Survey 1976

Earnings range (£)	% increase
0-10	25.0
10-12	20.8
12-15	16.7
15-20	12.5
20-22	11.4
22-25	10.0
25-27	9.3
27-30	8.3
30-32	7.8
32-35	7.1
35-37	6.8
37-40	6.3
40-42	6.0
42-45	5.6
45-47	5.3
47-50	5.0
50-55	5.0
55-60	5.0
60-65	5.0
65-70	5.0
70-75	5.0
75-80	5.0
80-85	4.7
85-90	4.4
90-95	4.2
95-100	4.0
100-110	3.6
110-120	3.3
120-130	3.1
130-150	2.7
150-170	2.4
170-200	2.0
200-250	1.6
250 or more	1.3

Average: Men 5.0%, Women 6.4%, All 5.6%

Public Sector Pay Settlements 1979 and the Wage Norm

		%	employment weight
February	LA manual	12	26
April	HM Forces	24.2	6
	BR	12-13	13
May	Civil Service clerical	25	10
	P.O. workers	10	20
June	Doctors and dentists	25	11
August	Electrical supply workers	23(2 stages)	8
	Police	13½	3½
September	Water workers	17	3
October	Gas workers	17	5
December	Miners	20	13

	% per annum		
	Private	Public	Norm
1979 2	15.1	17.1	15.7
3	14.5	14.1	14.4
4	17.2	19.2	17.8
Weight	.711	.289	

The Pay Board's estimate of the ex-post effect of exceptions and additions to the basic pay norm 1972-74

	1973 April-June	June-Aug.	Sept-Nov.	1974 Dec-March	March-May	June	Nov-Jun
(1) Equal pay							
no. of settlements	220	911	388	515	245	759	
no. covered (millions)		1.6	1.2	1.0	0.7	..	
Pay Board estimate of effect on wages (%)	..	..	..	0.3	0.3	0.3	
(2) Anomalies							
no. of settlements	..		150	..	193	..	343
no. affected (thousands)	..		62	..	818	..	880
estimate of effect on wages (%)	..	..	..	..	..	0.4	
(3) pre-standstill agreements							
no. of settlements	154	58	34	127	141	44	
no. covered (thousands)	1,041.8	487	831	1,702	1,005	460	
average no. covered (thousands)	6.8	8.4	24.4	13.4	7.1	10.5	
effect on wages (%)	..	..	..	..	..	..	
(4) flexibility margin							
effect on wages (%)	-	-	-	0.5	0.6	0.6	

Source: Pay Board reports.

Principal Public Sector settlements during 'n-1'

			% or £ p.w.
1970	November 6	Council workers	15% (£2.50)
	November 27	Miners	(£2.37 - £3)
	December 3	University teachers	10%
1971	January 12	Firemen	10%
	February 23	Civil service supervisors and technicians	17%
	February 25	Policemen	11-22%
	March 9	Nurses and midwives	8½%
	March 11	Civil service cleaners	13%
	March 19	Gas industry - manual workers	£2
	April 14	ASLEF	9%
	April 15	Electricity power workers	9%
	May 11	Electricity - white collar workers	£5.71-£6.73
	June 7	Government clerical officers	10 - 20%
	June 10	Civil Servants, administrative and executive staff	7 - 15%
	July 10	L.T. tube workers	8½-11%
	July 20	Teachers	10.8%
	July 23	Local authority white collar workers	7-12%
	July 30	Industrial civil servants	8½%
	November 30	Local government manual workers	7.4-7.8%
	December 17	Police	6½%
1972	January 24	Gas workers	8.2-9.1%
	February 3	Civil servants	7-7½%
	February 7	Electricity supply workers	8½%
	February 22	Nurses	8%
	February 25	Miners	£4.50-£6
	February 25	Post Office workers	8½%
	March 17	L.T busmen	8%
	May 22	Teachers	9.6%

APPENDIX D

ALTERNATIVE AGGREGATE MEASURES OF WAGES

APPENDIX D ALTERNATIVE AGGREGATE MEASURES OF WAGES

(i) Index of average weekly earnings

This is based on a monthly enquiry into average earnings by the Department of Employment. It originally covered all industries in the production sector but few in the service sector. A new series with wider coverage was introduced from January 1976 (see D.E. Gazette, April 1976, p.350). The shortage of observations on this new series makes it impossible to provide a long-run analysis whereas the 'old' index provides a long run of both seasonally adjusted and unadjusted data.

The 'old' index is described in articles in the March 1967, July 1971 and May 1975 issues of the DE Gazette. Aggregate and industrial results are provided by this index which is compiled from all weekly and monthly paid employees irrespective of sex, occupational status or hours of work. The industries covered account for just over one-half of total GB employment. Major exceptions are postal services, distribution, insurance and banking, education and health, and public administration. The new series now includes information on distribution, insurance and banking, professional and scientific services, and public administration whilst fuller coverage is now available for agriculture, mechanical engineering, shipbuilding, paper and printing, construction, transport and communication and miscellaneous services. The series is current weighted and refers to GB only. Fuller details are given in Dean (1980).

(ii) Index of basic weekly wage rates

This index measures the average movement each month in the level of full-time basic rates of wages or minimum entitlements fixed by a selection of national agreements and wage orders. The index has fixed (base) weights, the weights chosen reflecting the wage bill. The index refers only to manual workers whereas the monthly index of average earnings indicates both manual and non-manual workers. Industrial composition is given for this data and fuller details of coverage are given in Dean (1980).

(iii) Aberdeen wage settlements data

This data is described in Elliott and Shelton (1978) and is based on major wage settlements between 1950 and 1975. The information refers to manual workers only and is taken from the official information contained in Time Rates of Wages and Hours of Work and Changes in Rates of Wages and Hours of Work. Data is also available on settlement intervals and whether the increase was in hourly or weekly terms. The series differs from the official series of basic wage rates in that it is current weighted.

(iv) CEGP wage settlement data

This data is described in Coutts *et al.* (1976) and also refers to wage settlements for manual workers.

(v) Average wages and salaries

This series is derived by dividing the total sum of wages and salaries paid in any given period by the numbers in employment. It covers the UK and is comprehensive of all workers. It is also possible to form industrial disaggregation (but only annually). The wage and salary data is to be found in Economic Trends.

General issues

In terms of general policy considerations the most relevant wage variable is gross earnings per head since this is the magnitude that most directly affects labour costs. In aggregate this variable can be measured by combining data on wage and salary payments and the numbers of employees in employment. A proxy for this measure, which is available on a more frequent basis and at a greater level of detail is the monthly inquiry into average earnings. This, however, is not comprehensive since it is based only on a sample and it does not cover all the sectors of the economy.

Average weekly earnings is, however, made up of basic weekly pay, overtime payments and other premia, and may be influenced by changes in hours of work. Incomes policy may operate only on basic rates or it may generally influence the components of earnings unevenly. Another alternative is the index of basic weekly wage rates or settlements but these only cover manual workers.

In econometric work on the labour sector it has been fairly common to interpret the difference between basic rates and average earnings as 'wage-drift' and to attempt to model changes in wage-drift in terms of changes in the level of demand, the explicit rationale being that overtime payments and other shift premia increase as the cyclical demand for labour rises. An alternative description which also relates drift to the level of demand is given by Sargan (1980) who posits that if earnings are high compared with the wage rate then activity is high and workers try to consolidate their temporary prosperity by incorporating the higher level of earnings into the basic wage rate. This approach has some relevance to the treatment of incomes policy since some policies (e.g. the thresholds of 1974) have initially influenced earnings rather than wage rates but have eventually affected wage rates in very much the same way. However, it still seems over-simplistic to treat divergences between rates and earnings as functions of pure economic variables since in aggregate this gap will reflect the composition of bargaining porcedures and even at the disaggregated level changes in the series may be influenced by changes in the pattern of bargaining. The conventional model of wage drift implicitly assumes multi-employer industry-wide pay bargaining. Brown (1981) argues that the character of these agreements has altered fundamentally, particularly in engineering and chemicals where minimum wage rates have ceased to be 'floors' (where the raising of the minimum affects everyone) but have become 'safety nets' (where raising only affects the lowest paid). Brown shows that multi-employer bargaining only accounted for 27% of employees in 1978 with single employer bargaining accounting for much of the remainder and with single employer bargaining increasing with the size of establishment. Thus the conclusion is that earnings are now much more amenable to control by management and negotiation leaving much less room for wage drift than it did it the 1960s. In any event, the composition of national aggrements (which is the variable measured by the wage rates index) is important since, whilst for large areas, particularly the public sector, national agreements account for almost the whole of standard weekly earnings, in others (e.g. engineering) changes in national rates may only have a small immediate impact on actual earnings.

APPENDIX E

Estimates of Seasonal and Other Dummy Variables

Seasonal dummies

Table 6.2

	S1	S2	S3
Equation (1)	-0.0173**	-0.0197**	-0.0155**
	(-3.2)	(-2.7)	(-3.4)
(2)	-0.0179**	-0.0224**	-0.0172**
	(-3.3)	(-3.0)	(-3.6)
(3)	-0.0230**	-0.0205**	-0.0164**
	(-3.6)	(-2.6)	(-2.8)
(4)	-0.0089*	-0.0209**	-0.0213**
	(-1.8)	(-2.9)	(-5.2)
(5)	-0.0268**	-0.0126*	-0.0173**
	(-4.1)	(-1.7)	(-2.8)
(6)	-0.0237	-0.0176**	-0.0164**
	(-3.6)	(-2.2)	(-2.7)
(7)	-0.0226**	-0.00195**	-0.0165**
	(-3.5)	(-2.5)	(-2.8)
(8)	-0.0221**	-0.0179**	-0.0159**
	(-3.4)	(-2.3)	(-2.7)
(9)	-0.0091*	-0.0196**	-0.0199**
	(-1.8)	(-2.7)	(-4.7)
(10)	-0.0246**	-0.0231**	-0.0189**
	(-3.9)	(-2.9)	(-3.1)
(11)	-0.0229**	-0.0224**	-0.0149**
	(-3.6)	(-2.7)	(-2.6)
(12)	-0.0250**	-0.0275**	-0.0185**
	(-4.0)	(-3.3)	(-2.1)
(13)	-0.0263**	-0.0295**	-0.0179**
	(-4.3)	(-3.5)	(-3.1)

Table 6.3

	S1	S2	S3
(14)	-0.0289**	-0.0270**	-0.0164**
	(-4.0)	(-2.1)	(-2.3)
(15)	-0.0289**	-0.0239**	-0.0170**
	(-4.2)	(-3.5)	(-2.6)
(16)	-0.0258**	-0.0118*	-0.0193**
	(-4.1)	(-1.7)	(-3.3)
(17)	-0.0286**	-0.0213**	-0.0180**
	(-4.6)	(-3.0)	(-3.0)
(18)	-0.0288**	-0.0229**	-0.0177**
	(-4.6)	(-3.6)	(-3.6)

Policy dummies

Table 6.2

	D3	D6	D10	D12	D13	D14
Equation (2)	-0.0231	-0.0093	-0.0425*	- 0.0199	-0.0034	-0.0154
	(-1.5)	(-0.9)	(-1.9)	(-1.2)	(-0.2)	(-0.9)

Seasonal dummies

Table 6.4

	S1	S2	S3
Equation (19)	-0.0279**	-0.0103	-0.0198**
	(-4.4)	(-1.4)	(-3.2)
(20)	-0.0289**	-0.0235**	-0.0170**
	(-4.2)	(-2.1)	(-2.4)
(21)	-0.0288**	-0.0216**	-0.0174**
	(-4.3)	(-3.3)	(-2.7)
(22)	-0.0286**	(-0.0240**	-0.0139**
	(-4.5)	(-3.3)	(-2.5)
(23)	-0.0284**	-0.0211**	-0.0170**
	(-4.6)	(-3.4)	(-2.8)
(24)	-0.0284**	-0.0213**	-0.0183**
	(-4.6)	(-3.5)	(-3.1)

Table 9.1

	S1	S2	S3
Wage equation (1)	-0.0281*	-0.0214**	-0.0183**
	(-4.6)	(-3.5)	(-3.1)
(2)	-0.0284**	-0.0216**	-0.0183**
	(-4.6)	(-3.6)	(-3.1)
(3)	-0.0290**	-0.0237**	-0.0177**
	(-4.7)	(-3.8)	(-3.0)
(4)	-0.0291	-0.0235	-0.0177**
	(-4.7)	(-3.8)	(-2.9)
Policy equation (1)	0.3202	0.8207**	0.1440
	(0.8)	(3.0)	(0.4)
(2)	0.3144	0.8097**	0.1491
	(0.8)	(2.0)	(0.4)
(3)	0.5360	1.1371**	0.1176
	(1.3)	(3.0)	(0.3)
(4)	0.4953	1.2603**	0.1249
	(1.2)	(3.0)	(0.3)
Price equation (3)	-0.0225	0.1629	-0.2959
	(-0.7)	(0.6)	(-1.1)

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